AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Reg. U. S. Pat. Off.

NRA CODE GRAPHIC ARTS INDUSTRY 1934

Volume 71 Number 19

JULIAN CHASE, Directing Editor

DON BLANCHARD, Editor
P. M. HELDT, Engineering Editor — JEROME H. FARRIS, Ass't Editor
JOSEPH GESCHELIN, Eng. Editor — T. LAWTON SLAUGH, News Editor
ATHEL F. DENHAM, Detroit Editor — GEOFFREY GRIER, Art Editor

Contents

News of the Industry 567

Calendar of Coming Events 577

Holding Connecting Rod Weight Within Plus or Minus Two Grams Ends Selectivity at Chrysler Plant. By Joseph Geschelin 578

Just Among Ourselves 581

Dealers Surveyed by PAA Show Used Car Savings Largely Offset by Lower New Car Gross Margins. By Don Blanchard 582

Production Lines 584

Good Manifold Design Based on Specific Natures of Flows (Part Two). By P. S. Tice 585

Automotive Abstracts 588

Engine Torque Used to Reduce Pedal Pressure in New Eaton Clutch Actuator. By Athel F. Denham 589

The Forum 592

New Developments 596

Advertisers' Index 43

Automotive Industries is published every Saturday by

CHILTON COMPANY

Chestnut and 56th Streets, Philadelphia, Pa.

C. A. MUSSELMAN, President and General Manager
J. S. HILDRETH, Vice-Pres. and Director of Sales
W. I. RALPH, Vice-Pres. G. C. BUZBY, Vice-Pres.
W. A. BARBER, Secretary and Treasurer

Cable Address ..... Autoland, Philadelphia
Telephone ..... Sherwood 1424

OFFICES

New York—U. P. C. Bldg., 239 W. 39th St., Phone Pennsylvania 6-1100
Chicago—Room 1116 London Guarantee & Accident Bldg. Phone Franklin 9494.
Detroit—814 Stephenson Bldg. Phone Madison 2090.
Cleveland—1140 Guardian Bldg. Phone Main 6860.
San Francisco—Room 305, 444 Market St. Phone Garfield 6788.
Long Beach—1595 Pacific Ave. Phone Long Beach 613-238
Portland, Oregon—72 Fifth St.
Entered as second-class matter Oct. 1, 1925, at the post office at Philadelphia, Pa., under the act of March 3, 1879.

SUBSCRIPTION RATES: United States, United States Possessions, and all countries in the Postal Union, $1.00 per year; Canada and Foreign, $4.00 per year. Single Copies, 25c.

COPYRIGHT, 1934, CHILTON COMPANY

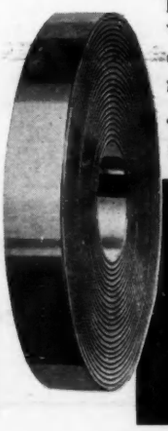
Member of the Audit Bureau of Circulations
Member Associated Business Papers, Inc.

Automotive Industries—The Automobile is a consolidation of the Automobile (monthly) and the Motor Review (weekly), May, 1902; Dealer and Repairman (monthly), October, 1903; the Automobile Magazine (monthly), July, 1907, and the Horseless Age (weekly), founded in 1895, May, 1918.

assures THOROUGH INSPECTION AND TESTING

SPECIALIZED PRODUCTION

Through every step of production Thomastrip is subjected to rigid inspection and testing. Gauge, width, temper and surface must conform in every respect to the specified requirements of the user . . . Producing cold strip exclusively, Thomas production is specialized. The attention of a centralized organization backed by adequate equipment, is concentrated on the quality production of one product only — Thomastrip . . . That is why so many manufacturers depend exclusively on Thomas for their cold strip requirements.



THE THOMAS STEEL CO. WARREN, OHIO
Specialized Producers of COLD ROLLED STRIP STEEL

THOMASTRIP
STRIP COLD ROLLED STEEL
BRIGHT FINISH • ZINC COATED
COPPER COATED • CADMIUM COATED

To Keep Abreast of The Industry

You Should Read

Automotive Industries

EVERY WEEK

●

Automotive Industries **is edited for administrative executives, production and sales managers, engineers, designers, shop superintendents and department heads in plants making all kinds of automotive products.**

It is published weekly and is up-to-the-minute with news and developments in the automotive industry, on the land, in the air and on the water.

725 Automotive Presidents, Vice-Presidents, Treasurers, General Managers, Purchasing Agents, Sales Managers, District Managers, Service Managers, Production Men and Engineers subscribed to it recently within a period of just 3 weeks.

Automotive Industries **now costs but $1 a year — 52 weekly issues — less than 2c a week. Mail your subscription today to**

AUTOMOTIVE INDUSTRIES

A Chilton Publication

Chestnut and 56th Streets, Philadelphia, Pa.

AUTOMOTIVE INDUSTRIES

Vol. 71, No. 19 ▫ THIRTY-SIXTH YEAR ▫ November 10, 1934

Sales Spurt as October Ends

Estimate Total at 176,000; New Model Delays May Cause Car Shortages

by Athel F. Denham
Detroit Editor, Automotive Industries

Domestic retail sales of cars and trucks took a sharp up-swing during the latter half of October, resulting in surprisingly large totals for the month. From deliveries in the first half it appeared that total sales in that month generally were well below September. Final returns, however, will show the reverse is true on a number of lines by a comfortable margin.

Part of this was due to a pick-up in truck and commercial vehicles, and a large part also to the effect of clean-up price reductions announced well before the month end by all manufacturers except Ford and Chevrolet. Since then Chevrolet also joined the parade, authorizing price reductions by dealers for clean-up prior to new model announcement, leaving only Ford selling at full price.

Mr. Chrysler explains it to Mr. Sloan after a call at the White House. From left to right Donaldson Brown, GM vice-president; Mr. Sloan in the background, and Mr. Chrysler.

October sales are estimated at 139,000 cars and 37,000 trucks for a total of 176,000 compared with 185,000 in September.

With the sales spurt continuing over into November, indications were that car shortages would be felt in many sections of the country by some manufacturers before new models—many of which have been delayed by last minute changes—can get into production in quantities. This is expected actually to reduce the potential sales total for some makes and models for the month of November in spite of the fact that dealer stocks are as a whole adequately high.

Used car sales apparently have not been keeping pace with new car deliveries, and an early clean-up of new car stocks should provide a major incentive toward efforts to reduce present used car stocks in dealers' hands.

Pontiac reports retail deliveries in the final 10 day period of October as 400 units greater than the second 10 days and 800 ahead of first 10 days with a total for the month of 4918. This figure exceeds the September retail deliveries.

Olds retail deliveries for October were 111 per cent ahead of last year and exceed the best previous October, in 1928, by 700 cars. Olds total sales for the first 10 months are 30,000 ahead of the same period last year.

Buick retail deliveries for the last 10 days of October almost equalled the first 20 days of month. The total for the month is well ahead of September of this year.

DeSoto reports total sales of Airflow cars

(*Turn to page* 595, *please*)

Car Makers Await Conference With President on Employment Inquiry

by Don Blanchard
Editor, Automotive Industries

The renewal of the automobile manufacturing code having become almost a foregone conclusion, its extension to Feb. 1, 1935, was far overshadowed by automotive interest in the President's announcement that he was ordering an investigation of employment conditions in the industry from the results of which he would determine whether union demands for a public hearing should be granted.

The car makers are in the dark as to just what role, if any, they are to play in this investigation and presumably their present uncertainty will not be cleared up until after the conference which Mr. Roosevelt wrote AMA president Alvan Macauley he would arrange following his election-day trip to Hyde Park, N. Y. The subject was discussed at a meeting of the AMA directors in Detroit this week, but no statement was issued as to what transpired, and under the circumstances it is reasonable to assume that no conclusions were reached.

(*Turn to page* 595, *please*)

G.M. to Stagger New Model Introductions
See page 571

Jan.-Sept. Dollar Volume Passes Billion Mark First Time Since 1931

The dollar volume accruing from sales of passenger cars in the United States from Jan. 1 to Sept. 30 of this year passed the billion dollar mark for the first time since 1931. The actual figures, based on list price, f.o.b. factory on the five-passenger, four-door sedan model in conjunction with the actual new car registrations on each model, is $1,093,900,000. Total unit sales for the period under review numbered 1,564,640, comparing with 1,204,664 for the same nine months of last year, a gain of 30 per cent.

Actually this nine-months' dollar volume exceeds not only the nine-months' values in 1933 and 1932, but also the total for the whole twelve-months' period of those years. This year's January-September total of $1,093,900,000 is slightly more than 300 million dollars greater than the 1933 figure for the same period, which was $789,500,000. The January-December total for 1933 was $980,400,000; for 1932 it amounted to $843,000,000.

Though the largest gains in total number of units and dollar volume were made in the Ford-Chevrolet-Plymouth class, a significant upward movement was noted in the next higher price bracket, the $750-$1,000 class. The gains in this latter group give some evidence that business is moving toward firmer ground, and that more money is gradually becoming available for purchase of cars outside the lowest price class.

While in actual numbers of units sold or dollar volume this middle priced class are not comparable with the low-priced field, yet on a percentage gained basis the medium priced group far outstrips the low-priced field. The Ford-Chevrolet-Plymouth group registered a total unit sale for the January-September period of 1,143,690 against 830,817 for 1933 for a gain of 37.9 per cent; this unit volume produced a dollar volume of $703,700,000 as compared with $456,600,000, a gain of 54.1 per cent. However, in the $750 to $1,000 class the total number of units sold during the first three-quarters of the current year were 285,100 against 93,500 for the same period of last year; this represents a gain of 205.0 per cent. In dollar volume this group showed a total of $232,500,000 compared with $78,800,000 for the same nine months of 1933, or a gain of 195.0 in dollar volume.

Figures for the entire industry are shown in the table below.

Automotive Dividend Rate 81 Million, Moody's Reports

The present dividend rate of automotive stocks, both car companies and parts and equipment concerns, is $81,000,000, according to a recent survey made by Moody's Investors Service. This figure represents a loss of $170,000,000 from the peak payment rate of $251,000,000. However, the present rate is a recovery of $35,000,000 from the low point which was $46,000,000, or a loss of $205,000,000 from the high point.

Arnold Lenz

Assistant manufacturing manager of Chevrolet who was awarded the John Hill Whiting gold medal by the American Foundrymen's Association

Geschelin to Read Diesel Engine Paper Before API

Joseph Geschelin, engineering editor, *Automotive Industries*, will read a paper entitled, "Outlook for the Automotive Diesel Engine in Heavy Duty Transport," at the annual convention of the American Petroleum Institute, Dallas, Tex., on Nov. 14.

The paper covers the present status of the high-speed diesel engine, its potential market, advantages and disadvantages. Fuel is found to be the controlling factor in the situation and a plea is made to the petroleum industry to take the initiative in the development of fuel specifications.

U. S. New Car Registration and Estimated Dollar Volume by Retail Price Classes—Nine Months

	UNITS					ESTIMATED DOLLAR VOLUME*				
			Per Cent of Total		Per Cent			Per Cent of Total		Per Cent
	1934	1933	1934	1933	Change	1934	1933	1934	1933	Change
Chevrolet, Ford and Plymouth	1,143,690	830,817	73.12	69.02	+37.9	$703,700,000	$456,600,000	64.33	57.84	+54.1
Others under $750	68,582	202,586	4.38	16.83	—66.2	47,200,000	131,700,000	4.32	16.68	—64.1
$751-$1,000	285,100	93,500	18.22	7.77	+205.0	232,500,000	78,800,000	21.25	9.98	+195.0
$1,001-$1,500	44,273	50,133	2.83	4.16	—11.7	54,800,000	58,300,000	5.01	7.38	—6.0
$1,501-$2,000	11,238	10,665	.72	.89	+5.6	20,800,000	17,600,000	1.90	2.23	+18.1
$2,001-$3,000	8,498	11,608	.54	.96	—26.8	23,000,000	28,500,000	2.10	3.61	—19.2
$3,001 and over	3,013	4,406	.19	.37	—31.6	11,900,000	18,000,000	1.09	2.28	—33.9
Total	1,564,394	1,203,715	100.00	100.00	+30.0	$1,093,900,000	$789,500,000	100.00	100.00	+38.8
Miscellaneous	246	949								
Total	1,564,640	1,204,664								

* All calculations are based on list price F.O.B. factory of the five passenger, four-door sedan, in conjunction with actual new car registrations of each model. The total dollar volumes for the different models are then consolidated by price classes.

U. S. New Car Registrations and Estimated Dollar Volume by Retail Prices Classes—September

	UNITS					ESTIMATED DOLLAR VOLUME*				
			Per Cent of Total		Per Cent			Per Cent of Total		Per Cent
	1934	1933	1934	1933	Change	1934	1933	1934	1933	Change
Chevrolet, Ford and Plymouth	109,483	112,482	74.54	71.24	—2.5	$65,600,000	$62,300,000	66.00	62.18	+5.3
Others under $750	4,265	25,795	2.90	16.33	—83.4	2,700,000	16,700,000	2.72	16.66	+61.6
$751-$1,000	28,284	12,116	19.25	7.67	+134.0	22,900,000	9,000,000	23.04	8.98	+154.0
$1,001-$1,500	2,976	4,854	2.03	3.07	—38.6	3,700,000	5,600,000	3.72	5.59	—34.0
$1,501-$2,000	782	656	.53	.42	+19.2	1,400,000	1,100,000	1.41	1.10	+27.3
$2,001-$3,000	869	1,631	.59	1.03	—46.8	2,200,000	4,000,000	2.21	3.99	—65.0
$3,001 and over	239	379	.16	.24	—36.9	900,000	1,500,000	.90	1.50	—40.0
Total	146,898	157,913	100.00	100.00	—7.0	$99,400,000	$100,200,000	100.00	100.00	—0.6
Miscellaneous	33	63								
Total	146,931	157,976								

Wide Significance Being Attached to NRA-FTC Basing Point Report Due Dec. 1

A comprehensive report on the basing point system in the iron and steel industry is in preparation by the Federal Trade Commission and the National Recovery Administration for presentation to the President by Dec. 1, in accordance with his order of May 30 approving the revised steel code. Since the report is likely to exert an important influence on future steel costs, the automotive industry, currently the largest consumer of ferrous products, is awaiting its publication with considerable interest.

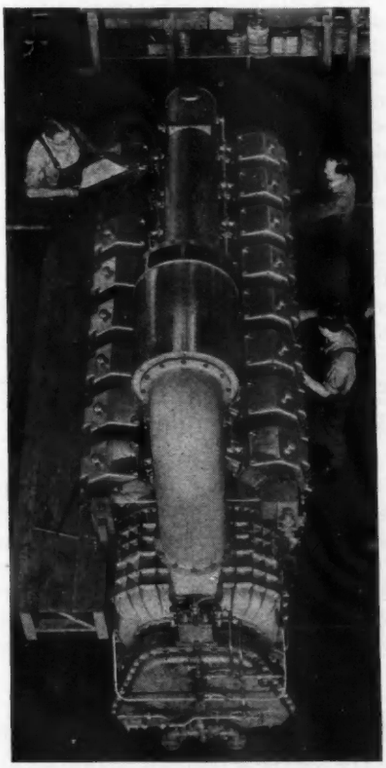
While accepting the necessity for the retention of the system during the emergency, Mr. Roosevelt in the May order pointed to the desirability "of working toward the end of having prices quoted on the basis of areas of production and the eventual establishment of basing points coincident with all such areas, as well as elimination of artificial transportation charges in price quotations." The order directed NRA and FTC to study the effects of the system and make recommendations for revisions in the steel code.

Especial significance is attached to the President's request for recommendations. For not only may such recommendations result in important changes in the steel code, but there is also the possibility, if not the probability, of legislation to change the present basing point system in the steel and other industries. While no intimation of this kind has come from either the FTC or NRA, it is well known that ever since the Commission made its original report in the Pittsburgh-plus case in 1924, legislation to abolish the system has been contemplated in various quarters, but never pushed. The subject has been constantly agitated and controversy over it reached a high point last spring in the Commission report to the Senate and in the Darrow report, both attaching the system and both of which brought blistering retorts from Donald Richberg, then active as NRA general counsel.

In view of the conflict of opinion on the system between the Commission on the one hand and NRA and Mr. Richberg, who is now the administration's chief coordinator, on the other hand, much interest is manifest as to whether the two Government bodies will be able to submit a joint report, or whether each will submit its own report. Ostensibly, the two agencies are collaborating on the report, but each is gathering its own data and preparing its own illustrations.

In the steel trade, it is assumed from the President's reference to "areas of production" that the report, or reports, to be made will endeavor to define the various steel producing districts. The assumption also is that the President had in mind the possibility of quoting prices on a common base for each district, rather than on an actual f.o.b. mill basis, though this is obviously speculative.

So far as the automotive industry is concerned, there is considerable conflict of opinion on the basing point system. Producers in the Detroit area in the main favor making Detroit a basing point for steel products used by the industry. There is, however, opposition to this proposal from manufacturers outside of the Detroit area who see their interests affected adversely thereby.



A 16 cylinder, 1200 hp. Winton railroad Diesel

Hammond Aircraft Gets U.S. Contract for 15 Planes

Hammond Aircraft Corp. of Ypsilanti, Mich., has received a contract for 15 of the 25 new airplanes to be purchased by the Bureau of Air Commerce for use by the Inspection Division. The airplane is a two-place, low wing monoplane, powered with a 95 hp. Menasco engine.

This plane is of unconventional design, having the power plant located at the rear of the cabin, and is equipped with a three wheel landing gear. Minimum speed is reported to be 35 m.p.h. and maximum speed 110 m.p.h. Delivery of the first plane is to be made within five months. The airplanes will cost $3,190 each.

It will be recalled that when bids for these planes were requested, the Bureau indicated that the ships were being bought as a part of its program to stimulate the development of light, low-cost planes for sale in large quantities.

Dallas Chevrolet Workers Get Pay in "Cart Wheels"

Twenty-five thousand new silver dollars were put in circulation at Dallas, Tex., on a single day when all Chevrolet employees were paid their earnings in "cart wheels." Each person receiving his pay was asked not to deposit the coins, but to use them in paying bills, buying groceries, settling the rent, etc. Every time an employee paid out one of the dollars, he declared that they were "Chevrolet dollars," and asked that they be kept in circulation.

British Car to Make Debut at New York Show

Among the features at the New York Automobile Show, to be held in Grand Central Palace, Jan. 5 to 12, will be a foreign car making its debut in this country. The newcomer is the "S.S.," a British product, manufactured by S.S. Cars, Limited, Foleshill, Coventry, England. Specification details of the models to be shown will be announced shortly. The car has won a number of speed contests abroad.

Chevrolet to Distribute Parts at Portland, Me.

Portland (Me.) has been made a distributing point for Chevrolet parts and accessories with the opening of a modernly equipped warehouse to serve dealers in Maine, New Hampshire, and Vermont, formerly covered from Cambridge, Mass. G. A. Blanchard has been made parts and service manager; P. V. Dimick is assistant manager.

Ford to Reopen St. Louis Plant

The Ford Motor Co. will reopen its assembly plant at St. Louis in time to start production on 1935 models, according to a recent announcement by the company. This plant has been closed for two years.

Gas Consumption Gains

Gasoline consumption in the first eight months of this year was up 6.81 per cent from the same period in 1933 to a total of 10,885,559,000 gal., according to the American Petroleum Institute.

Dillon Demands Industry Probe

Wants Executive Salaries, Reserves & Expense Items Revealed by President

DETROIT, Nov. 3—"A thorough and complete investigation" of the automotive industry which "will reveal to the public executive salaries, actual earnings, reserves and all items of expense charged to the industry" was urged on President Roosevelt in a statement issued here today by F. J. Dillon, general organizer of the American Federation of Labor. The statement quotes a telegram to the President protesting the continuation of the automobile manufacturing code without public hearing of labor's demands.

Apparently directed against General Motors as much as the industry as a whole, the statement takes exception to public pronouncements of Alfred P. Sloan, Jr., contrasts unfavorably the corporation's nine months' earnings with alleged average yearly wages, and calls for an inquiry into the activities and expenditures of General Motors in connection with "their illegal company union."

The statement follows:

"Yesterday we protested to the President of the United States the continuation of the present Automobile Code by sending to him the following wire: 'On behalf of the United Automobile Workers of the United States I respectfully protest the continuation of present Automobile Code without representatives of these thousands of organized workers being accorded the opportunity to formally present either to you personally or at a public hearing their objections and proposals covering same.'

"We greatly regret the continuation of the Code without an opportunity being accorded the representatives of the United Automobile Workers' Unions to publicly present their objections to the unfair merit clause and to submit their evidence that the present Code contributes to large and powerful corporations at the expense of their thousands of employees.

"It will be difficult for these thousands of workers to reconcile their average yearly wage of $800 with the net profit of $69,583,613 for the first six months of 1934, as made public recently by General Motors Corporation. By reason of the Code this corporation was thus able to pay an extra dividend to the stockholders for the first time since 1929, while no comparable benefit has accrued to the workers within the industry.

"The many thousands of workers whose wage rates have recently been substantially reduced will be unable to understand why it has been made impossible to present their side of the story in a public hearing.

"Mr. Alfred P. Sloan, Jr., President of General Motors Corporation, has frequently made public utterances setting forth his interest in the welfare of his employees and suggesting various plans of employee representation but evidently his idea of employee representation does not contemplate according them the opportunity of voicing their opinion regarding the sort of code best suited for the industry, which represents their life's work.

"The automobile industry needs a thorough and complete investigation, one which will reveal to the public executive salaries, actual earnings, reserves and all items of expense charged to the industry. Included in this investigation should be a thorough delving into the Corporations' activities and the monies dissipated in promulgating their illegal company unions, designed to defeat the spirit and intent of laws of the Land—monies that should have gone to the workers in the form of wages. There can be no mere perfunctory investigation but one which will reveal all of the facts and we hope this is what the President has in his mind. It goes without saying that the President will have the support and cooperation of the United Automobile Workers' Unions in the accomplishment of this worthy and necessary reform."

Supplementing the telegram previously referred to, Mr. Dillon wrote the President relative to the investigation of employment conditions. The letter was in the same vein as the statement just quoted. Specifically it called attention to "certain factors which constitute an integral part of the seasonal fluctuations which wreak such tremendous hardships and injustice upon the workers in this gigantic industry. Chief among these are (1) the speed-up system, (2) discriminatory wage standards, (3) job insecurity and extremely low annual earnings, (4) discrimination against older workers, (5) discrimination against Union members, (6) replacement of men by women workers."

Among the last groups to visit Ford Exposition at A Century of Progress was this Ford V-8 truckload of wives of delegates to the first annual convention of the American Trucking Association, held recently in Chicago.

Dillon Asks Sloan to Meet with Unions

A conference between GM president, Alfred P. Sloan, Jr., and the duly accredited representatives of the United Automobile Workers' Unions in the corporation's plants, was requested this week by F. J. Dillon, general organizer of the American Federation of Labor in Detroit, in a letter to Mr. Sloan.

"The conference is sought," Mr. Dillon said, "for the purpose of emulating the philosophy of industrial peace and understanding as enunciated recently by the President of the United States and to bring into practical reality the unmistakable meaning of Mr. Sloan's views as expressed in the pamphlet recently distributed to GM workers." The letter quotes Mr. Sloan as follows: "In the establishment and maintenance of an effective working relationship between management and employees under which the rights and interests of each may be mutually understood and kept in equitable adjustment."

Everett Zeunen Lost on Hunting Expedition

Hope of finding Everett Zeunen, assistant advertising manager, United Motors Service, alive dwindled as the week progressed. On a duck hunting expedition in Lake St. Clair, Sunday, Mr. Zeunen and his companion, Aubrey V. R. Pulleyblank, disappeared. Their boat was found drifting in Lake St. Clair after a sudden storm.

Approve APEM Supplement

The oil filter product group supplement to the APEM code has been approved by NRA.

G.M. to Stagger New Model Introductions

Change Provides More Continuous Employment Sloan Statement Says

NEW YORK, Nov. 10—To provide more continuous employment, certain General Motors new models hereafter will be introduced in late summer or early fall, as distinguished from the introduction of all new models at the end of the year, or the beginning of the following year, the current practice of the corporation and of the industry generally, Alfred P. Sloan, Jr., president, said in a statement issued today.

In part his statement said: "This year, in an important way, its (the corporation's) practice in the past with respect to model changes is being modified, concerning which change of policy some comment might be helpful. The change is being made directly in the interest of the wage earner, with the hope that a possible contribution can be made toward improving the continuity of his employment. The problem is to be attacked by an attempt to level the curve of consumer sales, and hence production, through readjustment of the time of new model introduction."

After citing figures to show the seasonal nature of automobile sales. Mr. Sloan said "such an unbalanced situation throws a burden upon the whole production machine. Additional workers are required for the period of the peak season, with but limited opportunity for employment during the balance of the year. Longer hours are essential for the whole working force in the peak season, to offset the necessity of short hours in the season when the merchandise cannot be sold except in greatly reduced quantity. This general situation has been intensified to the detriment of the wage earner and to the national economy in general by the code restrictions incident to the program of national recovery.

"While it is recognized that the 'selling of straw hats in the winter time' is bound to be of limited success, under any circumstances or conditions, nevertheless, the Corporation is determined to do what it can in the spirit of helpfulness and cooperation, in the interest of its workers, whom it recognizes as vital contributors to the success of its business.

"Unfortunately, certain economic policies have been adopted, which have importantly reduced, or eliminated that margin in which lies the possibility of substantially increasing the man hours of total employment. The result is bound to be a reduction in the total man hours of employment—with increased unemployment and a reduction in the standard of living. It is to be hoped that sooner or later, and sooner rather than later, this elementary fundamental fact, will be more generally recognized and appreciated."

Wholesale Code Authority

The code authority membership for the wholesale automotive trade has been tentatively recognized by NRA. Full recognition is contingent upon the different associations within the trade amending their by-laws to the satisfaction of the legal division of NRA. The members are:

Automotive Electric Association

E. S. Cowie, Cowie Electric Co.; W. N. Potter, United Motors Service, Inc.; C. T. Stevens, Reinhard Bros. Co., Inc.

National Wheel and Rim Association

J. F. Creamer, Wheels, Inc.; R. G. Nierman, Motor Rim Mfg.; S. M. Stone, Stone Wheel and Rim Co.

Motor and Equipment Wholesalers Association

S. B. Dean, Nichols, Dean & Gregg; T. Glascow, Glascow and Stewart Co.; G. H. Niekamp, Beck and Corbet; E. T. Satchell, E. T. Satchell Co.; F. G. Stewart, Standard Automotive Supply Co.

National Standard Parts Association

O. M. Anderson, Northern Automotive Supply Co.; V. C. Anderson, Motor & Axle Parts Service; L. H. Phelps, Phelps-Roberts Co.; A. E. Pouliot, National Bushing & Parts Co.; H. N. Nigg, Piston Service Co.

National Automotive Parts Association

E. S. Baldwin, Automotive Parts Co.; R. W. Boozer, Central Motor Parts Co.; W. W. Martin, Superior Motor Parts Co.

Automotive Engine Rebuilders Association

D. H. Goldman, K & G Auto Parts Co.; J. L. Heckman, Heckman Machine Works; R. G. Patterson, Piston Service Co.

Continental Adjourns Meeting to Dec. 22

DETROIT, Nov. 9—Continental Motors adjourned the annual meeting scheduled for today to Dec. 22. The meeting was to consider the type of mortgage to be offered as security for an RFC loan. Since the preparation of the details was not complete, the meeting was not held.

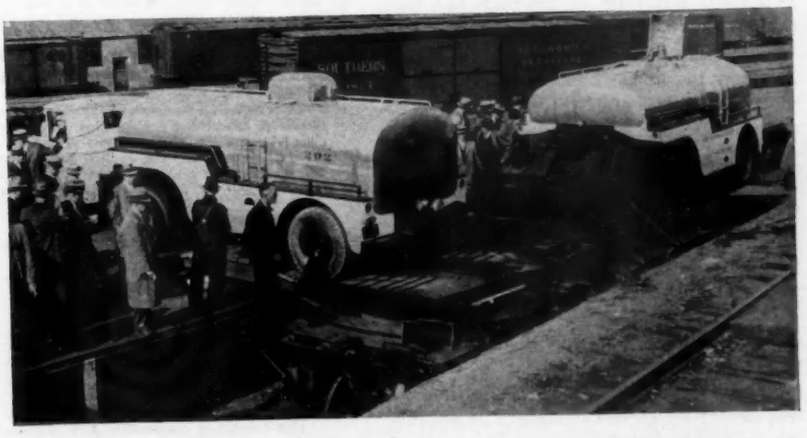
Transportation Men Meeting at Newark

Markham and Britton Warn Highway Users Against Added Legal Restrictions

NEWARK, N. J. Nov. 8—The Regional Transportation and Maintenance meeting opened here today with several hundred transportation men present.

Speakers at the opening session were Roy F. Britton and Gen. H. B. Markham, director of the American Petroleum Institute. Both discussed highway taxation and regulation, and warned the industry to be prepared for attempts to place greater burdens on highway transportation when 44 legislatures meet next year. Some of the objectives of legislative sessions will be: Further weight and dimension reductions of commercial vehicles; establishment of ports of entry in most States such as Kansas now has; provision of authority for railroads to buy up highway transport lines; reclassification of motor vehicles for purposes of taxation in accordance with weights and measurements; maximum speed and minimum power plant limits and compulsory installation of numerous appliances in the name of public safety; increased gasoline taxes and more diversions; requirements that from 30 to 50 per cent of gasoline taxes collected in each State be allotted to the municipalities for street purposes. Thirty manufacturers are participating in a big transportation exhibit at the Armory.

Rail-Highway Milk Transportation Coordinated



Develped to cut milk transportation costs, the equipment consists of two 2100-gal. semi-trailers which, during the rail haul, travel end-to-end on a flat car. Turntable mountings are provided for each trailer on the flat car so that at terminal points their forward ends may be swung out. A tractor then makes connection as shown and hauls the tank to its destination.

AFL Proportional Representation Blast Distorts True Intent of GM's Policies

A vigorous attack on the labor relations policies of General Motors, as set forth in the pamphlet recently distributed to the corporation's factory employees (AI, Sept. 15 and Oct. 20), has been issued by the Detroit office of the American Federation of Labor in the form of the handbill reproduced in the accompanying illustration.

By a series of rhetorical questions, the intent of the pamphlet is so distorted that President Alfred P. Sloan, Jr., is pictured as aiming to form a union which employees would be required to join. The questions infer that Mr. Sloan plans to write the rules for this union, select its officers and dominate its policies. These inferential charges are made despite the fact that the pamphlet states plainly that "Employees must be given entire freedom with respect to the selection and form and rules of their organization and their selection of representatives."

This attack on the sincerity and intentions of the corporation with which the handbill begins, however, apparently is only a sort of suspicion and interest arousing lead as the major portion of the attack is devoted to a denunciation of proportional representation—to which A. F. of L. representatives agreed in the automobile settlement negotiated by the President last March.

The bald statement is made that "Section 7 (a) does not provide for individual bargains between the employer and his employees" which statement the Federation says is law and has been set forth by the National Labor Relations Board and by executive orders issued by the President. In support of its contention, an executive order issued last February is quoted but fails to mention the fact that this executive order was immediately interpreted by Messrs. Richberg and Johnson to mean "that the selection of majority representatives does not restrict or qualify in any way the right of minority groups of employees or of individual employees to deal with their employer." Nor does it mention the second principle of the automobile settlement to which Federation leaders assented. This principle says, "If there be more than one group each bargaining committee shall have total membership pro rata to the number of men each member represents." And this settlement was described by the President as providing "a framework for a new structure of industrial relations. . . ."

Of course, it might be pointed out too that the Federation's interpretation of 7 (a) would not be law necessarily even if all administrative agencies were in agreement. The interpretation of the law is a judicial function and administrative opinions are not law until they receive the stamp of court approval.

Foreign Trade, Tariff Export Meeting Topics

Plans for further stimulating sales of American made passenger cars and trucks in foreign markets, and the status of the government's reciprocal trade agreement program with foreign countries were discussed Thursday at a meeting of the export committee of the Automobile Manufacturers Association. The meeting was held in the association's office in the General Motors Building, Detroit.

W. F. Thatcher of the Chrysler Export Corp., who has just returned from a four-months' trip through the most important countries of South America, discussed "The High Spots of the South American Market."

George F. Bauer, manager of the association's export department, presented a report of his trip through Europe during which he made a survey of automotive conditions, and attended the International Highway Congress in Munich as a delegate.

Mr. Automobile Worker!!

Did you know that Mr. Alfred P. Sloan, Jr., President, General Motors Corporation, has prepared for you a cleverly worded plan for collective bargaining?

Did you know that Mr. Alfred P. Sloan, Jr. proposes to make a union for you, compel you to belong, form its rules, select its officers and dominate its policy?

Did Mr. Alfred P. Sloan, Jr., consult you about this "plan"? Did Mr. Alfred P. Sloan, Jr. ask you if you desired to belong to his union?

Did Mr. Alfred P. Sloan, Jr. ask you what rules you would prefer, what officers you would desire or whether or not you desired him to dominate your Union's policy?

Did Mr. Alfred P. Sloan, Jr. explain to you what relationship his "plan" had to your wage rate, condition of employment, or hours of labor?

The fact is, Mr. Alfred P. Sloan, Jr., is either deliberately deceiving you or he doesn't know what he is talking about. Mr. Alfred P. Sloan, Jr., finds it difficult to make his employers' mind understand the meaning of collective bargaining. President Roosevelt has no difficulty in understanding the meaning of this term or its implications, as is shown in the Executive Order which he issued February 1, 1934, giving directions for the holding of elections of employee representatives as follows:

"Whenever the National Labor Board shall determine, in such manner as it sees fit, that a substantial number (as defined in the discretion of the Board) of the employees, or of any specific group of employees, of any plant or industrial enterprise or any industrial unit of any employer subject to such a code or agreement, have requested the Board to conduct an election to enable them to choose representatives for the purpose of collective bargaining or other mutual aid or protection in the exercise of the rights assured to them in said Section 7(a), the Board shall make the arrangements for and supervise the conduct of an election, under the exclusive control of the Board and under such rules and regulations as the Board shall prescribe. **Thereafter the Board shall publish promptly the names of those representatives who are selected by the vote of at least a majority of the employees voting, and have thereby designated to represent all the employees eligible to participate in such an election for the purpose of collective bargaining or other mutual aid or protection in their relations with their employer."**

In commenting upon this instruction from the President, the National Labor Board said: "It will be noticed that the foregoing paragraph fully sets forth the doctrine of majority rule (see its last six lines), a rule which the Board subsequently promulgated in the Denver Tramway Corporation case."

It is time that we speak out in plain language concerning the malicious lies which are being industriously circulated concerning Section 7(a), the company union and collective bargaining. To make this perfectly clear let us make a few statements which may startle Mr. Alfred P. Sloan, Jr., but which we are prepared to stand by because they are the law, have been set forth in decisions of the National Labor Relations Board and either expressly stated or clearly implied in the Executive Orders issued by the President of the United States:

1. Section 7(a) does not provide for individual bargains between the employer and his employees.

2. An agreement by an employee not to join a Labor Union is not now enforceable in the courts of this country.

3. An agreement between employer and employees for an employee not to join or assist an independent organization of his fellow employees is forbidden by Section 7(a).

Mr. Alfred P. Sloan, Jr., addressed the Boston Chamber of Commerce some months ago stating: "The National Recovery Act guarantees to every worker in industry, the right to bargain, either on an individual basis or on a collective basis, through the medium of such representatives as the employee may elect to designate."

Mr. Alfred P. Sloan, Jr. was trying to deceive you then as he is today. The National Recovery Act provides only for collective bargaining and makes no provision for individual bargaining or any scheme of proportional representation.

The company controlled and dominated union of workers is forbidden by law.

BE A FREE AMERICAN CITIZEN
JOIN THE INDEPENDENT UNION OF UNITED AUTOMOBILE WORKERS, AFFILIATED WITH THE AMERICAN FEDERATION OF LABOR

Issued by American Federation of Labor
Detroit Office
LOCAL ANNOUNCEMENTS **804 Hofmann Bldg.**

New Model Buying Lifts Steel Output

Car Makers' Commitments On Unchanged Price Basis; Earnings Still Inadequate

Moderately improved demand from automotive consumers lifted steel mill operations another notch this week; the American Iron and Steel Institute reported an increase in employed ingot capacity of 5.2 per cent to 26.3 per cent, the best showing made since July. Nearly all of the buying is for shipment during the remainder of this month and the first half of December.

Commitments of the leading motor car manufacturers for their initial requirements of new model material were on an unchanged price basis. Steel producers aver that prevailing quotations will continue in effect for first quarter 1935 business. Regular filing of prices for deliveries in the first quarter of next year is nominally set for Nov. 20, ten days following which order books are supposed to be opened under Code regulations. Following such filing, advances for the ensuing quarter are precluded, but reductions are permitted on sufficient notice. Market opinion has it that, if such reductions should be filed anywhere along the line, they would be accidental rather than premeditated.

Inadequate current earnings of steel producers are pointed to as the best possible answer to pleas for lower prices at this time, but if demand expands sufficiently over the next few months to make possible a rate of operations similar to that in vogue from April to June, when more than half the ingot capacity was employed, the picture of steel company earnings would be materially altered. For this reason forward looking buyers have become more reconciled to the continuance of present market levels until such time when increased production will enable steel producers to operate their plants on a more rational per ton cost of production basis. Reports that extension of ingot capacity, now under ban, may be freed from restriction under revised regulations of the National Industrial Recovery Board inject an additional element of possible future advantage to steel consumers into the situation.

Pig Iron—Blast furnace output is now on the increase. Automotive foundries are calling for slightly increased shipments, although melters continue to refrain from anticipating their requirements too far in advance. Prices are unchanged.

Aluminum—Secondary aluminum prices have been advanced ¼ @ 1 cent per pound, the latter rise applying to No. 12 alloy, the top grade of which class is now quoted at 16 cents. Virgin metal prices remain unchanged.

Tin—On the basis of London cables, indicating that prevailing Metal Exchange prices there were looked upon as minimum values by the Tin Control managers, Straits opened firm at 51⅛ cents on Monday, with consumers rather offish and unwilling to buy futures.

New General Motors Directors

From left to right they are O. E. Hunt, R. H. Grant, C. E. Wilson and J. J. Schumann, Jr.

Report Aircraft Engine of 1000 h.p. Being Tested

A prominent engine manufacturer is reported to be testing a twelve cylinder, inverted, "V" type, liquid cooled aircraft engine which develops approximately 1000 hp.

Perfex Acquires C.R.C.

Perfex Radiator Co., Milwaukee, manufacturer of automobile, truck and tractor radiators, car heaters, space heaters, etc., has purchased the business of the firm of C. R. C., Inc., Beloit, Wis., makers of radio and other electrical parts, and employing between 45 and 50 people. The newly acquired business will continue as the Perfex Controls Co. It has been in business 10 years. In recent years a large trade has been built up in switches, vibrators and suppressors for automobile radio installations. Julius K. Luthe is president of the Perfex interests.

New NSPA Members

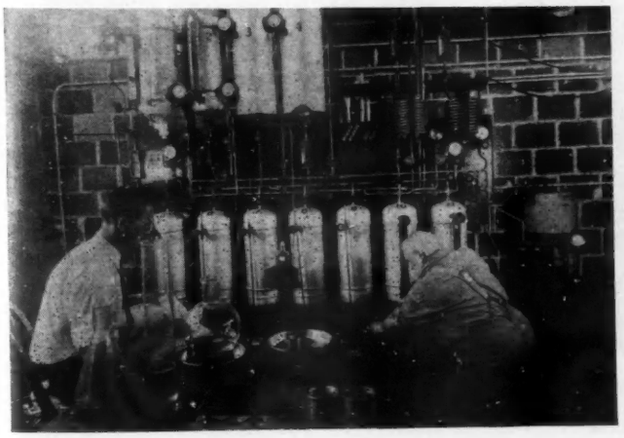
At the meeting of the executive committee held on Oct. 26, at N.S.P.A. headquarters in Detroit, the following applicants were elected to membership:

Jobbers — Peter Anderson Company, Lafayette, Ind., Clinton Anderson; Central Auto Parts Co., Cicero, Ill., Richard Willer, president; Felt Auto Parts Co., Salt Lake City, Utah, J. G. Felt, Secretary; Smith Auto Parts Co., Inc., Portland, Oregon, Frank S. Smith, Secretary.

Manufacturers—A P Parts Corp., Toledo, Ohio, H. F. Hadley, president; Automotive Equipment, Inc., Long Island City, N. Y., Earl V. Hennecke, president. Dayton Rubber Manufacturing Co., Dayton, Ohio, K. H. Glanton, vice-president; K-W Graphite Corp., Kansas City, Missouri, H. C. Williams, vice-president; Mallory Electric Corp., Detroit, Mich., Charles R. Flint, sales manager; South Bend Lathe Works, South Bend, Ind., J. J. O'Brien, secretary-treasurer.

de Havilland Engines Modified for Race

The deHavilland Gipsy-Six engines, used in the deHavilland "Comet" winner of the MacRobertson England-to-Australia race, were modified to develop 224 hp. maximum, instead of the normal 205 hp. Compression ratio was increased from 5.25:1 to 6.5:1. Fuel consumption is approximately 0.48 lb.-hp.-hr.



Small scale "pilot plant" illustrating the Clearosol refining process at the Socony-Vacuum refinery at Paulsboro, N. J. For details of this revolutionary solvent refining process for engine oils, see Automotive Industries for Nov. 3

Ten Months Output By AMA Members Surpasses '33 Total By 24 Per Cent

Motor vehicle production for the January-October period of this year by member companies of the Automobile Manufacturers Association ran 24 per cent ahead of their total 1933 output, a report submitted to the AMA directors at the meeting in Detroit on Wednesday disclosed.

Association members' output for last month is estimated at 90,377, a decrease of 22 per cent from the preceding month, and a decline of 11 per cent from October of last year. However this October total does not include Ford, and with the addition of that company's output it is anticipated that October production by all makers will verge on 125,000. This total compares with 138,365 for the same month of 1933.

The 10 months production by AMA members was computed on 1,846,017 cars and trucks—a gain of 31 per cent over the output for the same period of last year. The following summary includes figures of only those car producing companies which are members of the Automobile Manufacturers Association.

October, 1934	90,377
September, 1934	116,496
October, 1933	101,082
10 mos., 1934	1,846,017
10 mos., 1933	1,404,311
Total	1,491,852

Buick Re-establishes Own Field Sales Force

Buick is re-establishing its own field sales force. Fourteen zones are being set up with headquarters in New York, Philadelphia, Washington, Buffalo, Cincinnati, Detroit, Pittsburgh, Chicago, Minneapolis, St. Louis, Dallas, Kansas City, Atlanta and Memphis. Distributors continue to handle sales in California, New England, northern Ohio and northern Michigan.

A new southern region has been created with headquarters in Memphis with Henry C. Gillespie in charge.

Assistant general sales managers H. J. C. Miller and O. L. Waller will have charge of eastern and western districts respectively. Mr. Miller will make his headquarters in New York, and Mr. Waller in Chicago. At the factory the major change is the appointment of M. P. Tomlinson as business management manager succeeding Mr. Belfie who becomes manager of the Washington zone.

Buick has not had its own field sales organization since the formation of BOP early in 1932. Following the disbandment of that company last year, Buick and Pontiac sales were handled by the same field force. The re-establishment of its own field force does not come entirely as a surprise, since the introduction of the Model 40 in the spring of this year brought the Buick line rather close to Pontiac in price. Moreover, reports from the field indicate that there has been a tendency to split up Buick-Pontiac dealerships into separate accounts which, of course, makes operation through a joint field sales force less desirable.

Germany Clamps Lid on U. S. Car Imports

Germany struck on a new front this week in the battle it is waging to stem the adverse trend of its international trade. American automotive imports into the Reich are practically barred by an order putting such transactions on a barter basis, with Americans being required to buy 10 times as much German goods as their automotive sales to Germany. In exceptional cases, the proportion will be lowered to one to five. According to the Associated Press, another order is expected which permits the import of only such parts as German experts concede cannot be made in Germany.

General Motors and Ford have their own plants in Germany but to get any earnings from these plants, practically impassable exchange control barriers must be hurdled.

The new restrictions are due presumably to a 13 per cent loss in German automotive exports in September, the N. Y. *Times* says, contrasted with a 74 per cent increase in imports, mostly from France with the balance from the United States.

American exports of cars, trucks, buses, engines and parts to Germany in the first nine months of this year were valued at $538,207.

Thomas Bradley
New director of purchases of the Hupp Motor Car Corp.

GM Dealer Stocks Down 36,486 Units

Reflecting continued liquidation of field stocks, General Motors sales to U. S. consumers in October amounted to 69,090, exceeding sales to dealers during the month of 50,514 by a substantial margin. The total reduction in inventories in the September-October period amounts to 36,486.

Detail comparative figures follow:

	Sales to U. S. Consumers	Sales to U. S. Dealers	World Sales to Dealers
Oct., 1934	69,090	50,514	72,050
Sept., 1934	71,648	53,738	71,888
Oct., 1933	63,518	41,982	53,054
10 Mo., 1934	823,211	892,102	1,137,816
10 Mo., 1933	708,410	714,527	837,356

Chevrolet Will Stage Accessory Sales Drive

The Chevrolet Motor Company will inaugurate an accessory sales drive for the Christmas season. The program includes national advertising to back up dealer efforts, and a bonus plan for salesmen.

Nine Months' Earnings Statements

Car Companies	1934	1933
5 Companies Previously Reported	+$87,500,718	+$77,747,817
Chrysler Corp.	+ 9,422,826	+ 11,937,682
Hudson	— 1,563,144	— 1,307,422
American-LaFrance & Foamite	— 145,541	— 211,422
Total—8 companies	+$95,214,859	+$88,166,655

Other Automotive Companies	1934	1933
18 Companies Previously Reported	+$12,244,305	+ $6,939,719
Timken Roller Bearing	+ 2,999,506	+ 1,623,728
Midland Steel Products	+ 374,395	+ 664,991
Parker Rust Proof	+ 695,654	+ 417,813
Ex-Cello-O	+ 146,658	+ 182,070
Marlin-Rockwell	+ 258,031	+ 28,368
Young Spring & Wire	+ 718,556	+ 432,598
Bendix	+ 1,742,439	+ 1,096,367
Reynolds Spring	+ 195,987	+ 101,720
Trico Products	+ 1,453,235	+ 929,899
Total—28 companies	+$20,828,766	+$12,417,273

Chrysler Third Quarter Net and Sales Volume Below '33

Net Earnings	1934	1933	Per Cent Change
Third Quarter	$1,230,742	$7,190,149	—83
Nine Months	9,422,826	11,937,682	—21.1
Sales			
Third Quarter	$80,676,232	$87,290,212	— 6.5
Nine Months	311,780,091	202,061,415	+54
	Sept. 30, 1934	**Dec. 31, 1933**	**Sept. 30, 1933**
Cash and Securities	$50,718,685	$47,369,976	$61,615,500
Working Capital	54,092,210*	53,417,113	64,730,013

*After deduction of $10,000,000 called Dodge Bonds.

Olds Creates Sixth Sales Region; Blunden to Manage

Increased sales this year coupled with 1935 prospects have led Oldsmobile to create a sixth region in the company's sales set-up, according to D. E. Ralston, vice-president and general sales manager. The new division will be known as the southwest region with headquarters in Kansas City and will include the territories of Kansas City, Denver, Dallas and Oklahoma City zones.

L. J. Blunden will head-up the new region. Mr. Blunden has been zone manager in Chicago, and has been with the Oldsmobile organization for about 10 years. Russell Lesher has been advanced from Kansas City, where he has been zone manager for the last year, to replace Mr. Blunden at Chicago.

Other changes include V. A. Chalmers, who has been assistant zone manager at Chicago, goes to Kansas City as zone manager; A. J. Mutchler replaces Chalmers as assistant zone manager at Chicago. Mr. Mutchler has been stationed at Minneapolis. F. C. Walser, who has been metropolitan representative in Minneapolis, has been advanced to zone manager in that city.

White Co. Announcing New Medium-Heavy Duty Truck

A new medium-heavy truck, Model 718, is being announced by the White Motor Co. Its gross-weight rating is 20,000 lb. It comes in wheelbases ranging from 130 to 190 in., in steps of 18 in. The engine is a six-cylinder L-head type of 303 cu. in. displacement developing 90 hp. at 2800 r.p.m. Two five-speed transmissions are available, one with the fifth speed a direct drive, and the other with an over-drive. The four-wheel hydraulic brakes are operated through a vacuum booster. A full-floating, double-reduction rear axle with reduction ratios of either 7.32, 8.15 or 8.95 is provided. Tire equipment is 9.00-20 in. A chromium-plated radiator, slightly raked, with fully enclosed fenders, gives an attractive streamline appearance. The frame has side rails 8 in. deep and is heat-treated.

A roomy, well-ventilated 60-in. cab, with insulation covering the roof, dash, floor boards and special housing cover over the engine (which protrudes into the cab), is furnished at extra cost.

Stout, Knauss, Upson Injured in Night Crash

William B. Stout, president-elect of S.A.E., Stanley Knauss and Ralph Upson were recovering this week from a bad shake-up and bruises sustained when an experimental car developed by Mr. Stout collided head on with another automobile Sunday near Sturgis, Mich.

A storm which broke a few hours previously had broken off a telegraph pole which was hanging by the wires well above the road and out of range of the car's headlights. The Stout car hit the lower end of the cross-arm of the pole while traveling at a high rate of speed. The impact deflected the car to the side of the road and, into the path of the other automobile. The Stout car was slightly damaged.

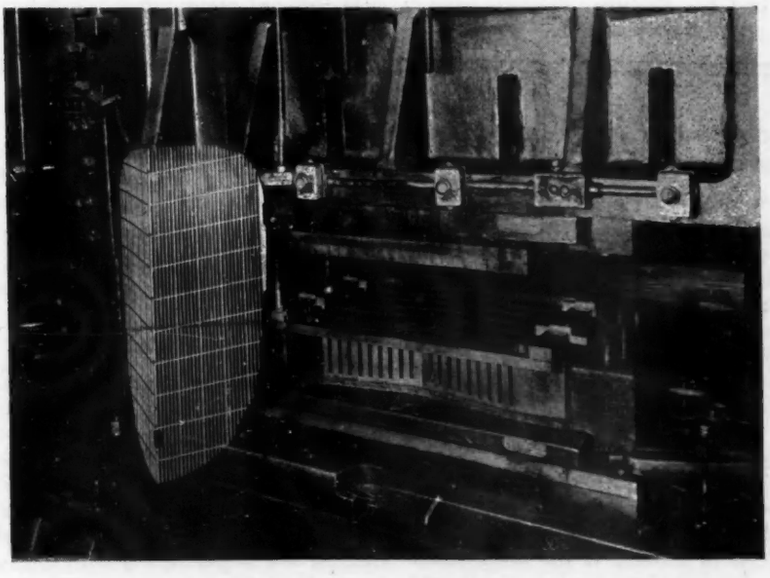
Mr. Knauss has been associated with Mr. Stout for a good many years, was manager of the Stout Airlines, and at present is manager of the Stout Engineering Laboratories. Ralph Upson, dynamic expert and designer of the all-metal dirigible built a few years ago in Detroit, has been associated with Mr. Stout both in the development of the Stout Rail-Plane and the new streamlined car which was on one of its test runs when the accident occurred.

Murray Rearranges Plant for '35 Work

Increased production schedules for 1935 by the Ford Motor Co. have necessitated a complete rearrangement of the Detroit plants of the Murray Corp. of America, according to C. W. Avery, president.

Aside from the body operations for Ford and other automobile producers, the company reports a considerably increased production schedule for next year in cushion springs and allied parts. Several large orders have been placed for custom built bodies for one of the higher priced car makers, and the corporation will increase its production of truck frames, the Avery statement says.

"We have made several changes in plant methods," Mr. Avery said, "in addition to rearrangement of our plant. One of the most noteworthy changes in Murray operation has been the elimination of all piecework in favor of day work.



Metal lace work at Hudson. View shows the set up for stamping complete grilles from the sheet metal blank

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

General business sentiment throughout the United States last week appeared to be better. Retail and wholesale trade continued active, and a good volume of wholesale orders for Christmas goods was placed.

Car Loadings Decrease

Railway freight loading during the week ended Oct. 27 totaled 624,252 cars, which marks a decrease of 16,028 cars below those during the preceding week, a decrease of 18,171 cars below those in the corresponding period last year, and an increase of 6968 cars above those two years ago.

Current Production Gains

Production of electricity by the electric light and power industry in the United States during the week ended Oct. 27 exceeded that during the preceding week and was 3.4 per cent above that a year ago.

Food Prices Falling

Retail food prices during the two weeks ended Oct. 9, according to the Bureau of Labor Statistics, declined by 0.7 per cent. The decline followed steady increases since April, 1934. Current prices are about 28 per cent above the post-war low level established during April, 1933.

Strikes Cause Employment Drop

Factory employment in the United States during September declined 4.7 per cent, while total payrolls decreased 6.8 per cent, according to the Bureau of Labor Statistics. Normally there is a seasonal increase in both employment and payrolls during September. Labor disturbances were partly responsible for the declines.

Farm Indices Up

According to the Bureau of Agricultural Economics, the index of farm prices on Oct. 15 stood at 100, based on the 1909-14 average as 100, as against 97 a month earlier, while the farm purchasing index stood at 79, as against 76. The farm price index shows an advance of 22 points since a year ago, while the purchasing power figure has increased 12 points.

Lumber Better

New business booked at the lumber mills during the week ended Oct. 27 was larger than for any of the three weeks preceding, but both production and shipments were lower than for any week since last July. New orders were also appreciably larger than those in the corresponding period last year.

Fisher's Index

Professor Fisher's index of wholesale commodity prices during the week ended Nov. 3 stood at 78.7, as against 78.8 the week before and 79.0 two weeks before.

Federal Reserve Statement

The consolidated statement of the Federal Reserve banks for the week ended Oct. 31 showed a decrease of $1,000,000 in holdings of discounted bills. Holdings of bills bought in the open market and of Government securities remained unchanged.

Unemployment Insurance Before Senate Committee

WASHINGTON—The Senate Finance Committee will meet here late in November to draft unemployment insurance legislation for introduction in the next Congress. It is believed that the legislation will provide for a tax on payrolls as did the Wagner bill considered by the previous Congress.

Rail Men Get Diesel Instruction From GM

The extent of GM's interest in the Diesel engines for rail use is indicated by course of training in the construction and operation of these engines recently instituted by the corporation for railroad men. The courses include lectures at the General Motors Institute of Technology, Flint, training at the corporation's laboratories in Detroit, and a week at the subsidiary, Winton Engine Co., in Cleveland.

Standards Bureau Measures Electrolyte Resistivity

Measurements on the resistivity of sulphuric acid solutions in the range from +86° to —40° F. have recently been completed by the electrochemistry section of the National Bureau of Standards.

In the course of the measurements it was found that the composition of solutions having minimum resistivity changes from about 31 per cent at 86° F. to about 26.5 per cent as the temperature is lowered to the freezing point, according to the Standards Bureau. An empirical relationship between resistivity, kinematic viscosity, and the absolute temperature was found.

Last year the Bureau published the results of its measurements on viscosity of solutions ranging in concentration from 15 to 45 per cent sulphuric acid at temperatures between +86° to —58° F. The determination of resistivity forms a companion project for this earlier work.

Congress of Industry Called by Noted Leaders

A Congress of American Industry, to develop a platform upon which the manufacturers of the country can unite and stand throughout the year, has been called by a committee of well-known industrialists, C. L. Bardo, president of the National Association of Manufacturers, has announced. The Bardo announcement states that the congress will be held in conjunction with the annual convention of the manufacturers' organization scheduled for December 5 and 6 at the Waldorf-Astoria, New York City.

Automobile members of the committee sponsoring the congress are Lammot duPont, chairman of the board of General Motors, and president of the duPont Co.; Alvan Macauley, Packard president; Alfred P. Sloan, Jr., GM president, and William L. Hoge, president of the Mengel Body Co.

This year the convention of the National Association of Manufacturers comes just prior to the opening of the new Congress and will be the medium through which the manufacturers will express their viewpoint on the major national problems the new Congress will be called upon to consider. At the convention the association's committee on Future Relations of Government to Industry will report on the NRA. James W. Hook, president of the Geometric Tool Co., is chairman of the committee.

Seek Composite Picture Of Used Car Operations

A composite picture of used car operations since the dealers' code became effective will be presented by the N.A.D.A. through a questionnaire sent to all dealers by the national association. The questionnaire is an effort to collect vital statistics on this phase of automobile merchandising and determine what effects the code operation has had upon this division of the industry.

According to N.A.D.A. this is the first time such an effort has been made to gather information on used car activities of the 30,000 automobile dealers in this country.

Ford to Build Electric Foundry

New Furnace at Canadian Plant for Production of Cast Crankshaft for Cars

Early next March the Ford Motor Company of Canada, Ltd., will begin work on a new electric-furnace foundry at its East Windsor, Ont., plant. This foundry (to which reference was made in the Nov. 3 issue of *Automotive Industries*) is intended for the production of cast crankshafts for the Ford V-8 and the Ford truck. So far no cast crankshafts have been used in Canadian-built Fords. As a result of a year's experience with these crankshafts in the United States it was decided to incorporate them in the Canadian product. The capacity of the new foundry will be 200 crankshafts per 8-hour shift, and 50 men will be employed in each shift.

According to president Wallace R. Campbell, the company looks for a great increase in business activity during the next two years and plans further plant modernization, for which the necessary capital outlay has been authorized already.

The new foundry building will measure 225 by 120 ft. The building itself will cost approximately $160,000, while the equipment will require an additional expenditure of $245,000.

Wayne Co. Registrations

New car registrations in Wayne County, Mich., for October totaled 2006 against 2895 for the same month last year, according to the Detroit Auto Dealers' Association. The year-to-date total for this county is 51,867 for this year, comparing with 41,632 for the January-October period of 1933. Ford led all makes with 730 units for October; Plymouth was second with 279, while Chevrolet drew third place with 233 units.

Truck registrations last month totaled 299 against 260 for the same month of last year; year-to-date totals were 4992 for the current year and 2357 for the corresponding period of 1933.

Sale of Franklin Assets Imminent, Report States

An order for the sale of the assets of the H. H. Franklin Manufacturing Co. will be sought by the trustees in bankruptcy from Ben Wiles, referee, according to reports. It is understood a financial group represented by J. E. Williams, former sales manager of the defunct organization, plans to bid in the assets and reopen the plant for production of a new air-cooled car.

This new group, reports state, will be the principal creditor of the old company through arrangements made to acquire all the old company's outstanding bank loans, which with accrued interest total approximately $2,500,000. This amount constitutes about 90 per cent of all claims. However, it is understood that prior to the delivery of the notes by creditor banks to the new organization it will be necessary to determine the value of 8323 shares of the Syracuse Land Development Co. stock held as collateral. The bankruptcy trustees have asked that the value be fixed at $201,625.

NRA Approves Trailer Industry Committee

Organization and procedure of the trade practice complaint committee of the trailer manufacturing industry has been approved by NRA. Members of the committee are:

Joseph Englaender, The Trailer Company of America, Cincinnati; Harvey Freuhauf, Freuhauf Trailer Co., Detroit; James Menhall, Highway Trailer Co., Edgerton, Wis.; E. Palmer, Kingham Trailer Co.; Louisville, Ky.; Robert Brodie, Owensboro Manufacturing Co., Owensboro, Ky.

Colgate Succeeds Stuart as Tyson Corp. President

Charles E. Stuart, president and treasurer of the Tyson Roller Bearing Corp., Massillon, Ohio, has resigned after five years spent in organization and operation of the plant. He will remain a member of the board of directors. Russell E. Colgate, who has been chairman of the board, succeeds Mr. Stuart as president and treasurer.

Other executives are: Ralph H. Maxson, executive vice-president in charge of operations; George C. McMullen, vice-president in charge of sales; George Neupower, secretary, and E. R. Earnest, assistant treasurer and purchasing agent. The reorganization of executive personnel follows closely upon additions that have been made to the field sales force, and is the first step in an expansion program decided upon by the company during the summer.

Joyce Forms Own Co.

Temple N. Joyce, formerly of B/J Aircraft Corp., is organizing a new company to manufacture military aircraft.

CALENDAR OF COMING EVENTS

SHOWS

Cleveland (Automotive Service Industries) .....Nov. 19-23
New York Automobile Show.....Jan. 5-12
Los Angeles Automobile Show.....Jan. 5-13
St. Louis Automobile Show.....Jan. 6-12
Cleveland-Silver Anniversary Show, Jan. 6-12
Cincinnati Automobile Show.....Jan. 6-12
Washington Automotive Assoc., Automobile Show .....Jan. 12-19, 1935
Toronto, Canada Automobile Show, Jan. 12-19
Newark, N. J. Automobile Show..Jan. 12-19
Buffalo, N. Y. Automobile Show.Jan. 12-19
Cleveland Automobile Show.....Jan. 12-19
Milwaukee Automobile Show....Jan. 12-19
Detroit Automobile Show.....Jan. 12-19
Brooklyn, N. Y. Automobile Show.Jan. 14-19
Philadelphia Automobile Trade Assoc. —Automobile Show .....Jan. 14-19
Columbus, Ohio Automobile Show Jan. 19-24
San Francisco Automobile Show.Jan. 19-26
Baltimore—Automobile Show....Jan. 19-26
Boston Automobile Dealers Assoc.— Automobile Show .....Jan. 19-26
Pittsburgh, Pa. Automobile Show, Jan. 19-26
Hartford, Conn. Automobile Show.Jan. 19-26
Syracuse Automobile Show .....Jan. 19-26
Chicago Automobile Show...Jan. 26-Feb. 2
Springfield, Mass. Automobile Show, Jan. 28-Feb. 2
Omaha Automobile Show.....Feb. 3-9
Kansas City, Mo. Automobile Show Feb. 9-16
Denver, Colo. Automobile Show..Feb. 10-23
Evansville, Ind Automobile Show.Feb. 23-27
Minneapolis Automobile Show....Mar. 9-16
Mankato, Minn. Automobile Show Mar. 16-23

MEETINGS

American Petroleum Institute, Dallas, Tex. .....Nov. 13-15
Society of Automotive Engineers—Chicago — (Tractor & Industrial Power Equipment Meeting)....Dec. 5-6

ANNUAL MEETINGS

Natl. Automotive Parts Assoc., Detroit .....Nov. 13-17
Natl. Standard Parts Assoc., Cleveland .....Nov. 16-17
Motor & Equipment Manufacturers Assoc., Cleveland .....Nov. 19-23
American Society of Mechanical Engineers—New York .....Dec. 3-8
Society of Automotive Engineers—Annual Banquet—New York .....Jan. 7
Motorcycle & Allied Trades Assoc., New York City .....Jan. 9
American Engineering Council, Washington, D. C. .....Jan. 10-12
Society of Automotive Engineers—Annual Meeting—Detroit.....Jan. 14-18
American Roadbuilders Assoc., Washington, D. C. .....Jan. 22-25
Automotive Parts & Equipment Mfrs., Inc.—Chicago .....Jan. 29

CONVENTIONS

International Foundry Congress, Philadelphia .....Oct. 22-26
American Foundrymen's Assoc., Philadelphia .....Oct. 22-26
National Foreign Trade Council, New York .....Oct. 31-Nov. 2
International Acetylene Assn., Pittsburgh .....Nov. 14-16
Motor & Equip. Wholesalers Assoc. Annual Convention—Cleveland, O. Nov. 16-17
National Standard Parts Assn., Cleveland .....Nov. 16-17
Motor & Equipment Mfrs. Assn., Cleveland .....Nov. 16-17
National Automobile Dealers Assn., Detroit .....Jan. 14-15

EXPOSITION

Natl. Exposition of Power & Mechanical Engineering (Biennial) New York, N. Y. .....Dec. 3-8

FOREIGN SHOWS

International Aeronautic Exposition, Paris, France .....Nov. 16-Dec. 2

Holding Connecting Rod Weight Within 2 Grams, Ends Selective Assembly at

Fig. 1—Preliminary weighing of rough connecting rod forging against the master. Sides of lower bearing end are ground before weighing

SELECTIVE assembly of connecting rods is a thing of the past in the Chrysler organization.

Connecting-rod assemblies ready for installation in the engine now are delivered from the machine shop accurately balanced about the same center of gravity and all finished within the total weight limits of plus or minus 2 grams (1/14 of an ounce).

This achievement, providing an absolute interchangeability of the vital reciprocating elements of the engine in large volume production is made possible through the use of one of the most compact layouts in the automotive industry, featuring an installation of Cincinnati Hydromatic vertical broaching machines. It is an interesting commentary that the whole set-up at the Chrysler East Jefferson plant is the result of close cooperation between the engineering department, the tool engineers and broaching machine experts.

As a result, we find here not only a unique combination of machining operations but an exceptional control of the weighing and balancing of the cap, rod and complete assembly from the rough forging to the finished unit.

With the thought that factory executives may be interested in the steps that led to this development we give below a brief summary of the development. To begin with, the possibility of producing connecting-rod assemblies by the method to be described in this article was first visualized by the Chrysler tool engineer, and his first step was to obtain a formal engineering release on the standard weight limit of plus or minus 2 grams. The second step was a personal contact with the forge plant, which resulted in an agreement to keep the rough forging within a limit of 2 oz. above a specified weight and no allowance below this weight. This weight tol-

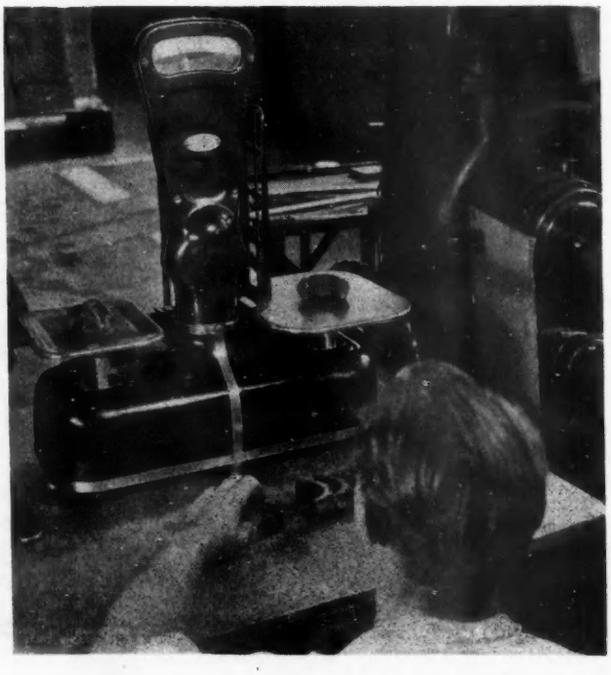


Fig. 2—Preliminary weighing of caps against master forging

Within Plus or Minus Two at Chrysler Plant

by Joseph Geschelin
Engineering Editor, Automotive Industries

erance has been satisfactorily met by a final coining operation after forging.

It was further decided to provide weight bosses at each end of the rod which could be machined off to bring about the proper balance of the assembly. This detail, together with the standard weight tolerance, were approved by the engineering department and embodied in the design of the new connecting rod.

Having disposed of these preliminarly steps, the tool engineers came to the problem of how this program could be carried out economically in large-scale production. And at this point they enlisted the interest and cooperation of the broaching machine engineers. This study resulted in the installation of a battery of special twin-ram broaching machines of 1500 lb. per sq. in. driving pressure providing two different set-ups, one for broaching the joint face and semi-circular bearing on the rod and cap, the other for trimming the back and sides of the bolt bosses on the rod, and the sides of bolt bosses and nut faces on the cap. The complete tooling up of this department was then built up around these central broaching operations and the weighing and balancing procedure.

With this brief introductory note, let us trace the steps in this new set-up. In the first place, each rod and cap is individually weighed against a master rod or cap and separated as weighed into four lots, each in the range of 15 grams apart, and all lots weighing above the zero point on the scale; that is, above the exact weight of the master. The purpose of the first weighing is to eliminate any light-weight forging which, obviously, would not meet the desired strength requirements. Before weighing, the sides of the crank ends are rough finished on both the rod and cap, being disc ground in the case of the rod and straddle milled in the case of the cap. These weighing operations are shown in Figs. 1 and 2, the zero point on the scale marking the exact balance between the work and the master.

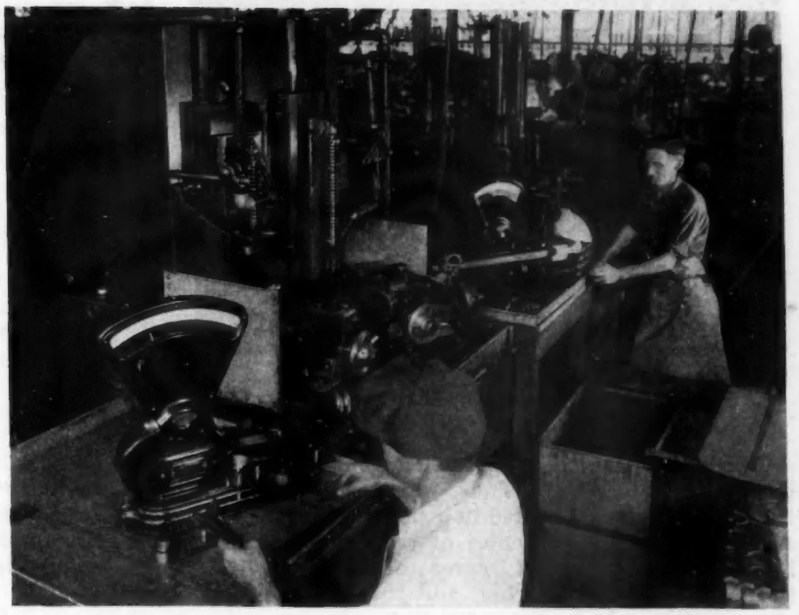


Fig. 3—Getting reading of both weight and location of gravity of rod, on one side of the machine, and weight of cap on the right of broaching machine

The next two machining operations are the most important in the whole procedure, since they lay the foundation for the ultimate control of balance and weight of the finished assembly. As shown in Fig. 3, each rod and cap now is weighed on the special Toledo scale at the stations shown on each side of the broaching machine. The scale reading is so calibrated as to control not only the amount of material to be removed but also the location of the excess weight with respect to the center of gravity of the rod.

The broaching machine shown in close-up in Fig. 4, which is now familiar to most readers of *Automotive Industries*, is of the double-ram type with the rams moving alternately up and down, one cutting at a time. The work table has an automatic indexing cycle so arranged that the work is automatically presented to the cutting ram while the other station is moved away to permit unloading and reloading. The set-up is designed with duplicate broaches, machining the connecting rod at the station on the left and the cap at the station on the right.

After the weighing operation described above, the scale reading is transferred to the dial gage on the machine, shown in the foreground, and this controls the relation of the work in the fixture to the cutting broach. For example, if a large correction is required at the big end of the rod, the scale readings as transferred to the dial gage would automatically move the rod closer than usual to the broach and thus would

Fig. 4. Reading on scales in Fig. 3 transferred to dial gage in foreground of the twin ram Cincinnati Hydromatic shown here. Rods are finished at the left, caps at the right, using the same type of broach

shift the relation of the center of gravity along the rod. Thus, when the wristpin bore is located in a subsequent operation the center of the bore would be somewhat nearer the top surface of the forging, and to accommodate this condition the boss at the upper end of the connecting rod is slightly elongated.

The foregoing operation is produced by the broaching machine at the rate of 140 rods and 140 caps per hour, each piece weighing exactly the same within 8 grams. Following the drilling and reaming of the wristpin hole, the rods and caps are routed to the second broaching set-up, using the same type of broaching machine and the same indexing table arrangement. Here the sides and back of the bolt bosses on the rod and the sides of bolt bosses and faces on the cap are broached to a fixed limit.

Following a number of routine operations on both the rod and cap, these parts are brought together for the final connecting-rod assembly, the first step of which is to file the burrs on the rod and cap and assemble. Then follow the more or less conventional operations of reaming the crankpin hole, grinding both sides of the crank end in separate operations on a No. 22 Heald rotary grinder, and finish ream of the wristpin hole. The crank hole is ground to size on a No. 72 Heald gagematic grinder, then the bronze bushing is pressed in the wristpin hole, burnished and diamond-bored on a Coulter vertical spindle boring machine, holding the diameter of the finished hole to a total tolerance of 0.0001 in.

The rod assembly is now completely machined and ready for the final weighing and balancing operation. As shown in Fig. 5, the rod is weighed on a special fan-type, twin-balance scale which weighs both ends simultaneously.

Using the scale reading found in the weighing operation, the operator sets the dial on the milling machine and mills off the weight boss first on the crank end, then reweighs and mills off the weight boss on the wristpin end. This results in an accurate balance about a fixed center of gravity and the maintenance of a weight tolerance in the finished rod assembly of plus or minus 2 grams.

The new Chrysler connecting-rod line is really an outstanding example of the manner in which important production problems may be solved through the cooperative effort of the engineering department, tool design, and the machine tool manufacturer. It also illustrates most strikingly the potentialities of the new manufacturing processes made available through the introduction of modern production equipment. Certainly there is a great contrast between the new method that produces matched rods within a tolerance of 2 grams and the older procedure which required selective assembly and made service a difficult problem indeed.

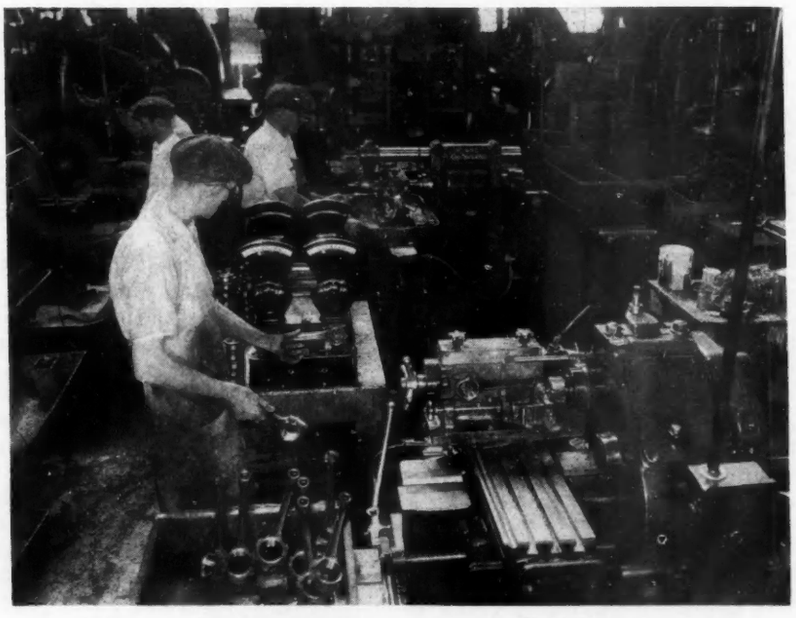


Fig. 5—Final operation is balancing of complete rod assembly to limits of plus or minus two grams. Rods are weighed on the fan-type scale, excess material removed by milling from weight bosses at each end; first at the big end, then at the small end.

JUST AMONG OURSELVES

Quick Results Demanded Of Trucking Code

THE trucking industry at least knows what it wants. Last week in Chicago it declared itself in favor of self-regulation under the code applying to for-hire operations. This was in the face of portents, as plain as a genuine Durante, that Administration-fostered legislation to regulate interstate for-hire trucking would be introduced in the next Congress.

It is because of these portents that the code must give quickly and give freely of boons and benefits if wholesale desertions are to be prevented.

The trucking industry wants some form of regulation. And it follows that if self-regulation doesn't pan out the interstate operators will take the pan and beat it loudly in favor of federal regulation.

The code's crucial future and the temper of its present adherents are apparent in this typical observation of a National Code Authority member: "I'm for the code but if it isn't working satisfactorily by the time Congress meets I'll write a Federal bill of my own."

* * *

Economic Lot Sizes Result in Economies

ONE of the largest problems confronting automotive parts makers is the matter of estimating the economic size of the lots in which production is scheduled. While many factors control the production schedule, there is a given range of lot sizes for each set of conditions that will tend to produce parts at the lowest cost.

This has been the subject of much discussion in management circles and easily the simplest exposition of the problem has been developed by Paul T. Norton, Jr., in recent papers read before the American Society of Mechanical Engineers. He shows that although, theoretically, there is one lot size that is most economical, practically there is a fairly wide range of values from which any individual solution may be selected without materially affecting the result.

The matter of economic lot size is so vital to parts makers in view of style changes, releases, from customers, etc., that factory management can't afford to overlook this method of analysis. It is of interest to note in this connection that Western Electric, with its schedule of many thousands of small metal parts, has been using a form of economic lot analysis for many years.

* * *

3,350,000 Units Next Year?

THE industry seems to be pretty well in accord that 1935 will bring a 10 to 15 per cent increase in production over this year, which would mean a total output next year of somewhere between 3,100,000 and 3,350,000 units.

Mr. Ford's announcement that he was planning for 1,000,000 cars next year checks rather closely with these totals. Assuming he gets about the same share of total sales he did this year, roughly 30 per cent, the industry total would be about 3,350,000.

The Market for a $385 Car

ONE of the large car makers is reported quietly to be investigating the potential market for a car priced at about $385. And there are other stories in circulation that certain producers have development work in a more or less advanced stage on cars to sell below the current Chevrolet - Ford - Plymouth level, apparently just in case it becomes necessary to bring such a car out quickly.

Interest in this subject undoubtedly stems from the fact that per capita purchasing power isn't what it used to be. Car prices have not kept pace. The public gets more for its money now, it is true, but nevertheless it takes just about as many dollars to buy the lowest priced car in 1934 as it did in 1929. This situation suggests that there may be a substantial number of potential buyers who can't or won't buy our present low-priced cars, but who could and would buy a car priced at $400 or thereabouts.

Such a car would have to be substantially lighter in order to permit profitable production at the price. If conventional design were followed, the car apparently would have to be smaller since the chances of making the necessary reductions in weight without decreasing the size, are not good. On the other hand, the industry has never been able to get at all "steamed up" about the salability of smaller cars since it is convinced that the public puts legroom above price.

The alternative to reducing the size appears to be to resort to unconventional design that will give both lightness and legroom, and which will lend itself to economical mass production. Admittedly this specification is easier to write than to fill.

* * *

RUMORS that certain 1935 cars would have steel roofs were confirmed last week. Credit advances in the art of noise reduction which have overcome the drumming problem.

—The Editors

Dealers Surveyed by PAA Show U
Largely Offset by Lower New C

THE survey of dealer operating statements completed recently by Edward Payton, dealer management consultant, was undertaken for the Pennsylvania Automotive Association primarily to get the answer to the following question:

To what extent, if any, have savings on used cars brought about by the dealer code been offset by reductions in factory discounts on cars and accessories and in mark-ups on freight, handling, conditioning, etc.?

As indicated in the brief report of the survey results published in these columns last week, Mr. Payton's report shows that, for the nearly 200 dealers who participated at least, the answer is that their savings on used cars were almost entirely offset by such reductions.

To generalize on the experience of 200 dealers out of a national total of more than 30,000 obviously would be hazardous. This is particularly true in the case of used car savings since it is conceivable that these might vary considerably in various parts of the country due to differences in the degrees of compliance which local code administrative agencies have been able to secure. It is less true, however, in the case of new car gross profit margins since they are determined to a considerable extent by standardzed policies which apply all over the country.

As to the representativeness of the dealers participating, the different makes handled show a reasonable correlation with the distribution of sales among the various lines. Moreover, during the period covered by the survey, the group which included perhaps 10 per cent of the dealers in Pennsylvania and less than one per cent of the national total, sold about 20 per cent of the new car and trucks registered in the state and about 1.8 per cent of the units sold nationally.

Sales Gain 24.5 Per Cent

A concise summary of the facts developed by the survey is presented in the accompanying table which is a condensed, consolidated operating statement for the participating dealers, comparing operations in the first eight months of this year with the corresponding period in 1933.

The grand totals show that gross sales were up from $31,796,943 last year to $39,513,668 this year for a gain of 24.5 per cent. Net profits which rose from $923,400 to $1,296,-331 show an even larger improvement of 41 per cent. In considering these impressive gains, however, it must be remembered that the four toughest months of the year are yet to be reported on and that on more than a few lines losses on the annual clean-up promise to be severe. Consequently a number of dealers who have studied the survey results express grave doubts that the group as a whole at the end of the year will be able to show much if any improvement in profits over last year despite the substantial increase in volume and the favorable earnings reported at the end of eight months.

Analysis of the figures indicates that the improvement in net profits shown, was not due to new car operations despite a 25.5 per cent increase in dollar volume in this category. In the new car department net profit, caught between rising expense and declining gross profit margins, shows a decrease in both dollars and per-

NEW AND USED CARS

	NEW CARS			USED CARS			TOTAL CARS		
	1933	1934	Percentage	1933	1934	Percentage	1933	1934	Percentage
Units	26,946	30,876	+14.5	32,919	39,779	+21			
Sales	20,325,012	25,528,336	+25.5	6,778,907	8,282,314	+22	27,103,919	33,790,650	+24.5
Gross Profit or Loss (−)	4,326,923	4,788,853	+10.5	−503,088	+37,539		3,823,835	4,826,392	+26
Percent Gross Profit or Loss on Sales	+21.28	+18.75		−7.42	+.45		+14.10	+14.28	
Expense	2,123,945	2,770,444	+30.5	1,127,686	1,255,523	+11	3,251,631	4,025,967	+23.9
Net Profit or Loss	2,202,978	2,018,409	− 7.2	−1,630,774	−1,217,984	−25.4	572,204	800,425	+40
Percent Net Profit of Sales	10.82	7.92		−24.1	−14.71		2.11	2.37	
Percent Net Profit of Gross Profit	50.8	42.2		None	None		15	16.6	
Sales per New Unit	754	827		252	268		1,006	1,094	
Gross Profit per New Unit	161	155		−19	+1		142	156	
Expense per New Unit	79	90		42	41		121	131	
Net Profit or Loss per New Unit	82	65		−61	−40		21	25	
Other Income									
Other Deductions and Adjustments (−)									
Final Net Income									

Used Car Savings Car Gross Margins

by Don Blanchard
Editor, Automotive Industries

centage of sales—from $2,205,978 to $2,018,409, and from 10.82 to 7.92 per cent.

While expense was going up due in part at least to the code, new car gross margins were going down because of reductions in factory discounts on cars and accessories and on mark-ups on freight, handling, conditioning, etc. On over $5,000,000 more new car volume, gross profit increased only $461,930, or 10.5 per cent as compared with a 25.5 gain in sales. As a percentage of sales, new car gross margins were 21.28 per cent last year and 18.75 per cent this year, a difference of 2.53 per cent. On $25,528,336 of sales, the percentage difference amounts to $645,867. This figure represents the additional gross the group would have earned on this year's sales volume with last year's percentage of gross margin on new cars.

Used car data show the group converted a $503,088 gross loss last year into a $37,539 gross profit this year. The loss last year amounted to 7.42 per cent on used car volume of $6,778,907 and if the group had sustained the same percentage of loss on this year's sales of $8,282,314, their gross loss would have been $614,548. Adding this figure to the $37,539 gross profit they actually made, a total of $652,087 is obtained which is the saving on used cars, this year against last, after adjusting for the differences in volume.

Volume Reduction Was Assured

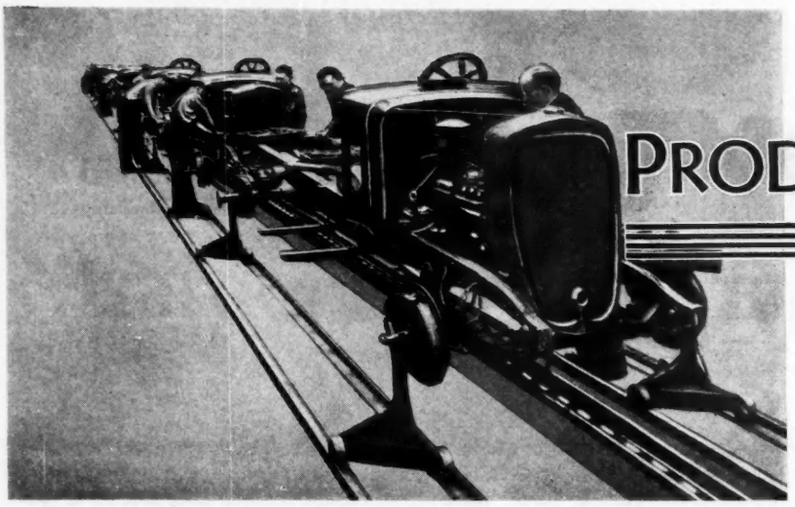
It may be urged that if these dealers had reduced their used car allowances by $652,087, as compared with 1933 practice, and there had been no compensating adjustment in delivered prices by reducing discounts and mark-ups, the group would not have enjoyed so large an increase in volume. Undoubtedly that would have been the case, but it is obviously impossible to evaluate the precise effects of this situation. The effect on volume might have been so serious that the group would have made less money, or the reverse might have been true. However, public reaction to last spring's price increases leaves little reason for doubting that volume would have suffered —how much is anyone's guess.

Although few dealers perhaps have described the direct objective of their code in just this manner, their real purpose in writing that document was to increase their margin of gross profit on car sales. By so doing, they felt they would assure the net profit for which they were in business. Apparently they didn't anticipate the reductions in new car gross profit margins which have been effected in the last year and probably if they had, they couldn't have taken care of the situation in the code since some, at least, of the factors are outside the scope of the code. Consequently they felt if they could write rules that would cope with the used car situation, they would attain their objective of more gross profit on car sales.

The survey proves, at least for the group of dealers participating, that under the code used car rules they have been successful in coping with the used car situation. On the other hand, the survey shows that the dealers participating have not been successful to any important extent in attaining the trade's real objec-

(*Turn to page 587, please*)

AUXILIARY DEPARTMENTS												
SERVICE			STOCK ROOM			OTHER		TOTAL AUXILIARY			Grand Total All Departments		
1933	1934	Percentage	1933	1934	Percentage	1933	1934	1933	1934	Percentage	1933	1934	Percentage
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2,231,108	2,722,920	+22	2,461,917	3,000,098	+22	.....	.....	4,693,024	5,723,018	+22	31,796,943	39,513,668	+24.5
1,172,843	1,346,995	+14.5	766,775	924,225	+20.5	3,870	2,890	1,943,488	2,274,110	+17	5,767,323	7,100,502	+23
52.7	49.5	.....	31.2	30.8	.....	.....	.....	41.4	39.6	.....	18.14	17.96	.....
1,026,648	1,254,267	+22	448,166	498,678	+11	6,495	.....	1,481,309	1,752,945	+11.72	4,732,941	5,778,913	+22
146,195	92,728	−36.7	318,609	425,547	+33.5	−2,625	2,890	462,179	521,165	+12.9	1,034,383	1,321,590	+28
6.66	3.30	.....	12.99	14.21	.....	.....	.....	9.84	9.11	.....	3.25	3.34	.....
12.45	6.86	.....	41.6	46	.....	.....	.....	23.8	23	.....	17.91	18.60	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	93,878	108,993	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	−204,861	−134,252	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	923,400	1,296,331	+41



PRODUCTION LINES

MoTung

Several years ago, J. V. Emmons of Cleveland Twist Drill predicted the advent of a molybdenum high-speed tool steel. It's here in the form of MoTung, a moly-tungsten material containing about 8 per cent moly and 2 per cent tungsten. It is said to be easier to work and costs somewhat less although none of the properties of a high-grade tool steel are sacrificed. By using less alloy ingredients and more of the elements available domestically, the new tool steel is in line with the national defense policy, i.e., the availability of materials in time of stress.

AGA Show

Oct. 29 to Nov. 2 marked the sixteenth annual convention and exhibition of the American Gas Association at the world's largest auditorium, Atlantic City's Convention Hall. Among the exhibitors familiar to readers of *Automotive Industries* were the Surface Combustion Corp., who showed their new modernized heating furnace and a line of gas-fired unit heaters; Air Reduction Sales Co.; Leeds & Northrup; and the Tinnerman Stove & Range Co. with the line of speed nuts that has attracted so much interest lately.

Die Castings

Herbert Chase, one of the likeable figures in automotive engineering and formerly engineering editor of *Automotive Industries*, has just written a book on die castings. Those familiar with Herb's work will rightly surmise that this book is a thorough-going scientific approach to a subject of greatest interest to automotive engineers and production men. But in addition, the book has the authoritative flavor associated only with studies backed by the actual experience of the authorities in the field. The book, "Die Castings," is published by John Wiley & Son. It runs 265 pages, replete with drawings and photographs. It covers applications, alloys, design principles, testing, and methods of finishing. All for $3.50 net.

Without Peer

Judging from what we hear, a prominent eight that's to be tooled up this fall will feature production equipment, the like of which has never been seen before. Not only is it expected to set new standards of process and low cost but it will offer a new high in appearance value. The whole line has been styled by an industrial artist, thus representing the professional touch in line and contour and color.

Facts Pay

While it's true that the machine tool builder is out to sell machine tools, it is equally certain that he wants to do a sound selling job. He doesn't want a one-time business—he tries to build up friendship and acceptance by recommending a sound, paying investment. One of the ways in which the factory executive can do the most for himself is to give the equipment engineer the precise facts about the productivity and condition of the old machine.

What Next

We are told that the next move in the cast crankshaft development is the use of malleableized metal possessing high ductility. It seems that several people are working it out.

Lack Skill

Many times this year we have heard well informed men say that there is a dearth of skilled mechanics in industry. This naturally is a direct outgrowth of depression conditions and particularly a serious let up in apprentice training. A number of organizations are beginning to do something about it.

Code Effects

Codes of fair competition have created many new situations. One effect has been a stimulation of cost-reducing equipment in an effort to hold down the cost of the product to the public. At the same time such equipment will cost more than ever because it is built under the code. In the meantime there is a growing tendency to write into new or renewed codes provisions restricting the installation of any new production equipment.

Cemented Carbides

An unusually comprehensive manual on the grinding of cemented carbide tools has been issued by the Carborundum Co. It takes up all the fine details of grinding, lapping, selection of wheels, etc. Ask us for "The Grinding of Cemented Carbides" if you have anything to do with tools.

T-C News

From the lips of several observers who have returned from Europe we learn that British manufacturers have been doing some great things with cemented carbides. Apparently there are some things to be learned from our cousins.—J. G.

MANUFACTURING MANAGEMENT METALLURGY

Good Manifold Design Based on Specific Natures of Flows

by P. S. Tice

Part Two — Part One Appeared in the October 6 Issue of Automotive Industries

STROBOSCOPIC observations and high-speed motion-picture records forming a part of this examination check closely the estimated extents of the fields of influence of the scavenging flows. Under all conditions of speed and load, and from all cylinders, they extend back into the longitudinal header to points well beyond the junctions of the outlets with the header. That most of the fuel thus displaced from the end outlets remains in the headers with which they are joined is unmistakably seen; while it is equally unmistakable that most of the fuel displaced from the center outlet is swept away from it and made unavailable for its subsequent charging.

On these grounds, cylinders 5 and 2 would be expected to receive somewhat richer and more diluted charges than other cylinders. Likewise, cylinders 3 and 4 should receive less fuel and less diluent than others; with cylinders 1 and 6 intermediate in both respects. While the test method does not permit of separate statements of fuel and diluent distribution, it may be taken with some degree of justification that the positions of the peaks, as in Fig. 2, represent the fuel distributions and that the characteristic slopes of the curves near the peaks express the effects of the relative dilutions.

Experimentally determined distribution errors are summarized in Figs. 9 and 10. Impoverishment of the center cylinders seems to vary nearly linearly with the speed; or perhaps it would be more correct to say, with the duration of the disturbing force. The ease with which fuel can be swept back and out of a valve pocket and the supply passage immediately adjacent thereto, has an important bearing on the extent of this disturbance. That the error is greater when running throttled is probably accounted for by the accompanying greater rate of fuel vaporization, which under the circumstances can only act to exaggerate the errors in liquid fuel distribution.

Similar but greater increases in relative error with throttling are found for the cylinders of the end pairs, in the upper part of Fig. 9. Here speed affects the error differently than in the case of the center cylinders. If all the fuel lost to the center cylinders were gained by the intermediate cylinders (5 and 2) into which the scavengings from the center cylinders can enter most directly, then the upper portion of Fig. 9 would be an inverse of the lower portion.* The facts are, of course, that the fuel lost to the center outlet can never be passed solely and directly to the cylinder immediately preceding it in the firing order, and that the charges to the ends of the manifold are handled and worked upon in the end bends, where a highly characteristic flow pattern is im-

*From some points of view it seems helpful to plot the errors of Fig. 9 against relative values of the product (density, velocity, diameter), as in Fig. 9a. Here, in so far as they are in approximate agreement, single curves are drawn for both road-load and full-load, and the center cylinder losses are shown inverted upon the gains of the intermediate cylinders as compared with the end cylinders. There are only very few points badly out of line; neglecting these points and assuming that the only cylinders to suffer losses are the center ones, the final average apportionment of fuel works out as here shown.

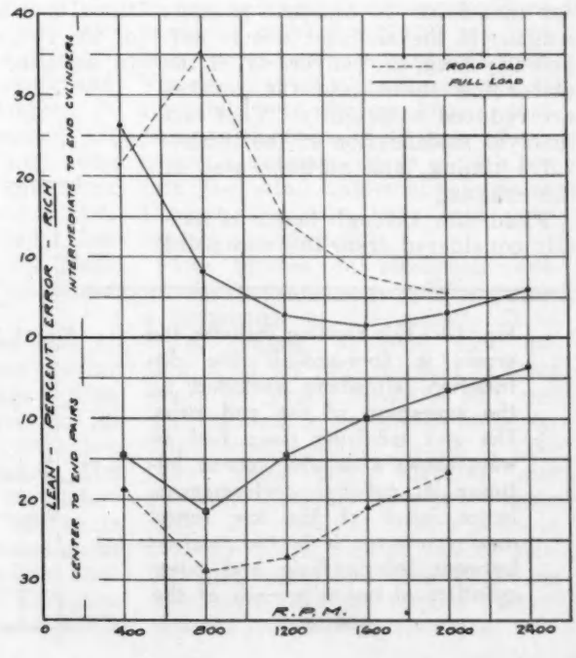


Fig. 9—Characteristic fuel-distribution disturbances in the Tee-type manifold of six-cylinder engines

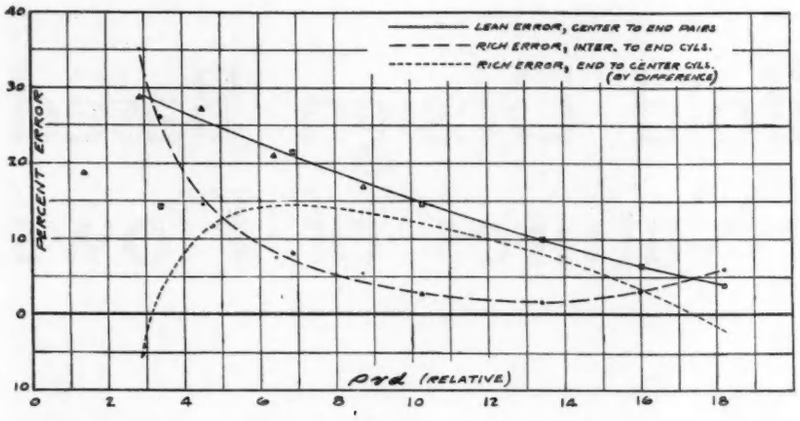


Fig. 9a—The points of Fig. 9 plotted to show a possible relationship between the errors found for the throttled and the unthrottled conditions. Except in the lowest part of the range, the big spread is between the center and the intermediate cylinders

posed upon them and their whole content of liquid fuel is definitely rearranged.

The situation with respect to center-outlet performance may be summarized by saying that: (a) considerable fuel is lost to it; (b) fuel so lost is added to the supplies of the end pairs; (c) in so far as the scavengings pass directly to the intermediate cylinders, the latter are enriched and have disproportionately great dilutions; and (d) no commensurate contributions are received by the center cylinders. This particular pattern of intake flow is due to the relationship of the total volumes of the intake passages from riser to valve seats, to the volumes involved in the flows themselves. If all of the passages were equal, there might be no disproportionate behavior whatsoever, and that independently of their actual lengths or volumes. Like freedom from disproportional behavior on these points is indicated for manifolds of unequal passage lengths if the shortest one is sufficiently long, or, conversely, if the disturbing flows into the intakes are reduced sufficiently. This last involves modification of the intake-valve timing, and perhaps also of the exhaust.

Fluid flow through bends is usually considered from the viewpoint of the added resistance due to the bend.* From the present viewpoint the important thing is the effect on the path or paths of the liquid accompanying the air in the bends. Since very much, if not most, of the fuel is on the passage wall when it reaches the end bends, the directions of the forces in the approximate boundary layers of the air stream are of importance as determining the movement of the liquid. That the major liquid flow paths follow the manifold wall surfaces from the entrance on needs no separate demonstration, since the effectiveness of riser- and tee-heating, and the various accumulations of fuel with which most are familiar, can be accounted for only on this basis. Visual observations also remove all doubt on this point. That fuel gathers on the walls is largely due to the heterogeneous motion of the air stream, both when flowing and when not flowing, and to the many periods of zero translational motion. An important aspect of the subject is that engine speed in no wise affects the occurrence and the relative durations of the starts, stops, and reversals of flow. In general, the contents of the intake passage are at a standstill during the same fraction of the total time at top speed as at low speed. This has a bearing on the possible degree of cylinder filling, as well as on the fuel distribution.

In flow through a pipe bend the inertia of the air causes it to swing to the outside, thus building up the pressure in the outer regions of the passage and reducing it in the inner regions. This pressure gradient induces flow from outer to inner regions of the space, but the compensating or pressure adjusting flow takes place along or in close proximity to the bounding surfaces of the bent passage, for the reason that no other path is possible in the face of continuance of the major flow.

In all cases of fluid flow, the fluid in the exact bounding layer, in contact with the wall, does not move at all, but is strongly held in place. As the distance from the stationary wall increases, so does the fluid

*The pressure gradients of Figs. 3, 5, 6, 7 and 8 are indicative of the resistance to flow following inclusion of an added bend with an added length of passage.

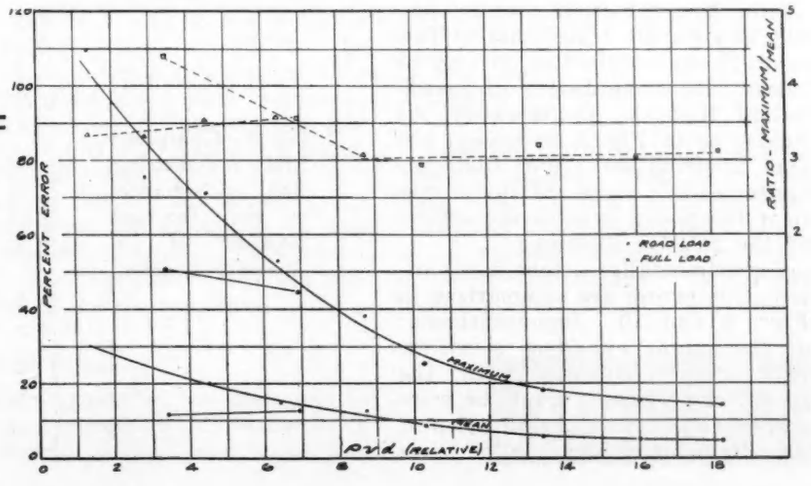


Fig. 10—This plotting includes the errors in fore-and-aft tee distribution, elsewhere excluded by the averaging of the end pairs. The end receiving more fuel always shows a greater spread between its cylinder performances, hence much of the low range maximum error is in the relation between intermediate and outer cylinders at opposite ends of the engine

motion relative to the wall increase. Thus, as the air involved in the flow around the bend comes into close proximity with the wall, its velocity component in the general direction of the bend axis is reduced, and the effectiveness of the newly applied component roughly parallel with the periphery of the passage (the "compensating" flow previously referred to) is thereby increased, with the result that the flow paths close to the walls approximate helices of decreasing pitch, converging upon the region of least pressure at the inside of the bend.

When liquid fuel is introduced into a passage in which there is an air stream of the character described, the wall liquid accumulates in this low-pressure region. Not only is liquid already on the walls constrained to flow in this manner, but initially entrained liquid is removed from the stream and added to the wall liquid by the same mechanism that is responsible for the pressure gradient across the passage. Further, the rate of wall flow thus induced is directly dependent upon the rate of change of direction in the bend, hence the "shorter" the bend the greater the specific accumulation of liquid in the low-pressure region.

The flow paths of the wall liquid change inappreciably in a given manifold, over the usual range of flow rates; and their effective forms are as indicated in Fig. 11, for a circular section having a mean radius of bend of 0.75 *d*. The fuel so concentrated is at once involved in an elongated rotational eddy, whose position and extent are also depicted in Fig. 11. Where the air flow passes through cycles comprising stoppage and reversal of direction, the alternative condition to Fig. 11 is one of simple stoppage of wall flow and collapse of the liquid-including eddy. Relatively much of the liquid passing the bend is thus constrained to use a definitely located and small portion of the section, which is, in the manifold of Fig. 1, positioned to bias strongly the distribution of liquid between the siamesed cylinders of the end pairs. Flow induced by each cylinder of the pair produces the same pattern in the bend, and to this extent they make equal contributions to the disturbance.

The error thus caused tends to be greatest at minimum speed and density, Figs. 9 and 9a, and it approaches its minimum in a manner suggesting that it is inversely proportional to the forces represented by the eddy. Considering that the eddy is alternately built up, destroyed, and built up again, together with the relative magnitudes of the forces available for so doing, and hence the rates of its rebuilding, and finally the probable relative degrees of attainment to equilibrium, it becomes possible to explain in a general way the occurrence of intermediate minimum values of the error.

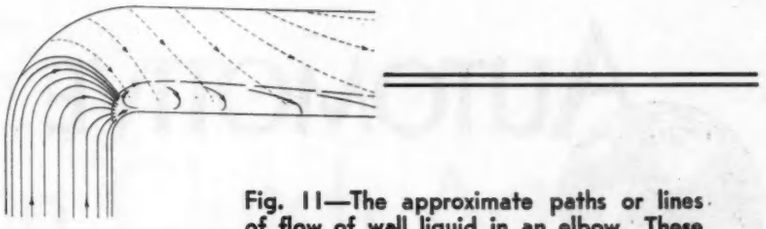


Fig. 11—The approximate paths or lines of flow of wall liquid in an elbow. These duplicate each other on opposite sides of the plane containing the axis. The eddy involves the converged wall liquid and circulates it as the arrows indicate

Of all the generally useful conclusions on distribution that can be drawn from this work, the outstanding one is that the details of intake manifold design have to be related to the specific natures of the flows that are imposed upon it. There is no one "best" intake manifold.

It may also be concluded that the flows imposed upon the manifold are capable of modification, to make equality of distribution somewhat less difficult of approach.

High Carbon, High Chromium Tool Steels

W. H. WILLS of the Ludlum Steel Co. at the A.S.M. meeting presented a paper on high-carbon, high-chromium tool steels, in which he described tests on three grades of such steel. One was a straight- chromium type with 2.40 per cent of carbon and 11.50 per cent of chromium; the second was similar to this but also contained 1.00 per cent of vanadium, while the third was an air-hardening steel, with 1.55 per cent of carbon, 12 per cent of chromium, 0.25 per cent of vanadium and 0.80 per cent of molybdenum. It was found impossible to satisfy all industrial requirements with one grade of high-carbon, high-chromium steel. Good production records have been made with all three types, but some users will insist that one grade is better than the others with respect to resistance to wear.

The steel with the 1 per cent of vanadium has proved a more popular grade than the regular grade of high chromium steel, due largely to its better resistance to shock, its other qualities being much the same. The air-hardening grade, with low distortion and better machining quality, is in good demand although some claim that the vanadium-chromium steel has better resistance to abrasion. Taking everything into consideration the air-hardening steel seems to have the widest field of application.

Dealers Surveyed by PAA

(*Continued from page 583*)

tive when the code was written—more gross profit on car sales—due to reductions in discounts and mark-ups. As the table shows, gross profit on new and used car sales combined increased only from 14.10 per cent last year to 14.28 per cent this year. The net of it all is, as anyone who is in touch with dealers knows, that many of them feel that their efforts to put a greater degree of stability into the retail automobile business through the code, have been very largely circumvented.

The figures on stockroom and service operations are in a sense a by-product of the survey. It is worth noting, however, that despite a 22 per cent increase in shop sales, the group shows a 36.7 per cent decrease in net profits on labor. This decrease is due mainly to narrower gross profit margins, due probably to higher shop labor costs under the code. It is also possible that the profit possibilities of selling cars under the code looked so attractive, that the service station suffered from lack of attention.

AUTOMOTIVE ABSTRACTS

Longer Life for Diesel Bearings

HENSCHEL & SON, German manufacturers of automotive Diesel engines, have come to the conclusion that the frequently observed destruction of Diesel-engine bearings, particularly connecting-rod bearings, is not due to rough operation but to the work of high compression. In a gasoline engine the work of compression varies with the load on the engine, while in a Diesel it is independent of load. Also, instead of burning out as in a gasoline engine, the white-metal lining either cracks or flakes off. Among the suggestions offered to prevent trouble from this source are the following: Use of a lower compression ratio to reduce the work of compression (12.5 to 1 instead of from 16 to 20 to 1); effective cooling of the lubricating oil by the use of oil coolers and circulating pumps of large capacity; use of special bearings with a paper-thin lining of lead bronze of suitable composition; the choice of a suitable type of crankshaft with a main bearing adjacent to every throw. When designing an in-line engine for minimum length, the greatest bearing lengths are obtained with symmetrical crankpin bearings.—Stephan, *ATZ*, August 25.

Shorter Process for Surface Hardening

IN the Shorter process for surface hardening the surface is heated by means of an oxy-acetylene burner and immediately quenched by a jet of water following the acetylene torch. Samples of various steels were recently submitted by the United Steel Companies to the Patent Gear and Metal Hardening Co. for treatment of the surface by the Shorter hardening process. It was shown that the Shorter method can be applied successfully to a wide range of steels. As regards initial surface hardness and depth of hardening, no advantage was found in the use of alloy steels. On the other hand, satisfactory hardness is developed in alloy steels that may be chosen because they give good mechanical properties to the core.—*Engineering*, Sept. 28.

Krupp Diesel-Locomotive With Mechanical Drive

A 600-HP. switching locomotive has been built by the Friedr. Krupp Co. of Essen, Germany, for the Japanese State Railways. The engine is a six-cylinder design, operates on the four-stroke cycle, and delivers its rated output continuously at 540 r.p.m. It is built of thin steel castings and light-metal alloys on a welded steel frame, so the specific weight is only 18 lb. per hp. The casing is divided into two parts, one consisting of the base plate and crankshaft bearings, the other of the crankcase and cylinder block. There are two inlet and two exhaust, one fuel, one safety, and one air-starting valve per cylinder.

The engine transmits power to the drive wheels through an hydraulic clutch and a mechanical gear box. The clutch comprises four cylinders arranged radially, the pistons of which are connected by Scotch yokes to a crank on the driven shaft. Opposite cylinders are connected by pipes and a circular passage in the casing, this passage containing a regulating valve. The transmission, which is of the conventional mechanical type, is designed to give speeds of about 6, 15 and 37.5 m.p.h. at normal engine speed. Gear changing is effected electro-magnetically, the gears remaining constantly in mesh.—*Engineering*, Sept. 7.

The Earth's Minerals

IN a British Association paper on The Exploration of the Mineral World by X-rays, Prof. W. L. Bragg said that minerals represent matter in the ultimate state of equilibrium. They have fallen into so low a pit of low potential energy that no chemical change can tempt them to desert it. That state of low-potential energy is one of order and not of disorder. A crystal is more stable than a jumble of atoms; the perfect geometrical arrangement of a crystal represents matter in its most dead and inert form, from which nothing further in the way of change can be expected.

Eight elements compose 98 per cent of the earth's solid crust; most of the others occur only in odd cracks here and there. The common elements are oxygen, silicon, aluminum, iron, calcium, potassium, sodium and magnesium. The bulk of the crust is oxygen. The rocks are made of oxygen atoms cemented together by silicon, aluminum and a few other elements.—*The Engineer*, Sept. 21.

Vibrations Break Cylinder Head Studs

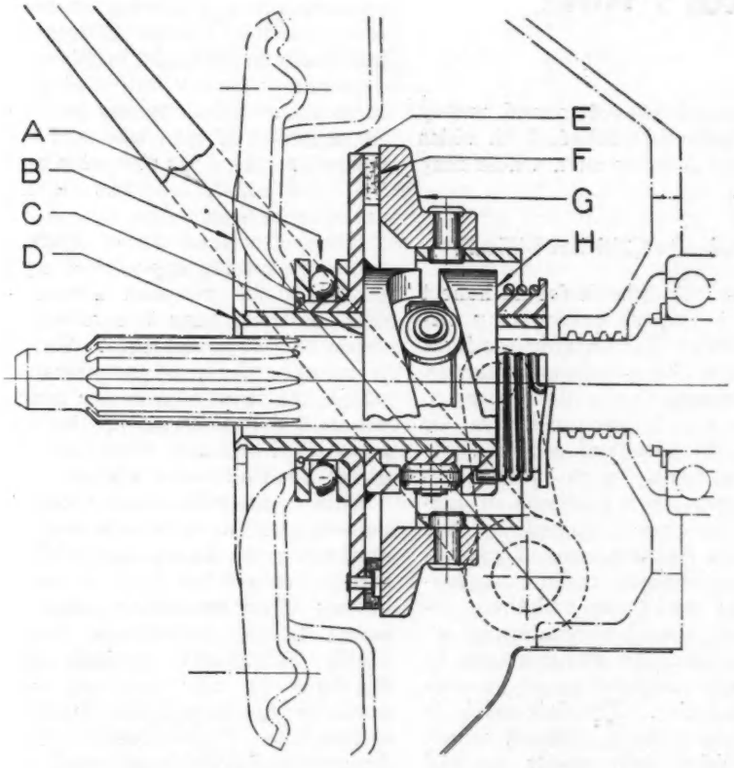
IN a report presented to the Engine Section of the French Society of Automobile Engineers, M. Ziembinski analyzes the stresses in a bolt or stud subjected to an initial setting-up tension and an additional force, with special reference to the case of cylinder-head studs. He reaches the conclusion that an additional force may, in certain cases, fail to increase the initial tension on the bolt or stud. In other cases it may add in part to the initial stress. In the case of cylinder-head studs, 20 per cent or 10 per cent of the force of explosion, at the utmost, will be added to the initial tension on the bolts. In spite of the fact that this increase in tension is quite small, it may provoke breakage of the bolts by reason of the vibrations which it is capable of inducing. (*Journal de la Societe des Ingenieurs de l'Automobile*, June-July issue.)

1935 Humber Line Announced

HUMBER cars for 1935, of which an announcement has just been made, show no important modification in either chassis or bodywork. A refinement designed to minimize cylinder wear consists of double control of the radiator shutters by both a thermostat and the engine oil pressure. By reason of the oil-pressure control the shutters are closed as soon as the engine is switched off, and the heat is therefore retained. This is considered a valuable feature for doctors and others using their cars for short trips with numerous stops. Multi-rate springs is another new feature. As the springs flex under load, additional leaves come into action, making them stiffer.—*The Autocar*, August 24.

Engine Torque Used to Reduce Pedal Pressure in New Eaton Clutch Actuator

by Athel F. Denham
Detroit, Editor, Automotive Industries



A SIMPLE device which makes use of engine torque to reduce the required clutch-pedal pressure to a minimum is announced by the Eaton Axle Company of Cleveland. This clutch actuator not only makes the clutch pedal as easy to operate as the accelerator, but also eliminates the necessity for take-up adjustments during the life of the clutch lining.

Increase of engine torque in both passenger and commercial vehicles during recent years has made it necessary for manufacturers to either increase clutch sizes, which increases costs and is limited—particularly on passenger cars—by clearance considerations, or to increase the spring pressure on the clutch plates.

The latter solution has been the one most widely adopted. It has led to either (1) long pedal travel, ((2) increased frequency of need for adjustment, (3) high pedal pressure, or combinations of all three, in the form of compromises.

The addition of the Eaton clutch actuator does not change the actual operating characteristics of the conventional clutch, except that the reduced pressure required improves the means of governing clutch engagement.

The accompanying illustration shows how the unit operates. The major change in the clutch itself—not shown—is that the cover plate stamping *B* is extended inwardly to support the actuator-carrying sleeve *D*. This sleeve, of course, is integral with the clutch and rotates at engine speed.

The major parts of the actuator mechanism are the two cams *C* and *H*, which are separated by rollers. The front cam *C* has integral with it a thrust plate *E* provided with a friction facing *F*. The pressure plate *G* does not rotate but is directly connected to the clutch pedal linkage and moves forward when the clutch is released, and vice versa.

As this plate *G* is moved forward it engages the friction facing of plate *F*, slowing the plate down slightly. This reduction in speed produces relative motion between the cams *C* and *H*, causing the front cam to move forward, carrying the plate *E* with it. It will be seen, therefore, that there is a continuous follow-up action of the mechanism, which automatically, and to all practical purposes instantaneously, adjusts itself to the position of the clutch pedal.

The reason for the low pedal pressure, of course, is the mechanical advantage offered by the lead of the cams. The cams are designed to give sufficient lift for clean clutch release and to compensate for outward release lever travel caused by wear of the friction facing. There is no adjustment to care for in the actuator during the life of the clutch.

The thrust bearing *A*, which contacts the clutch release levers, is in operation only during the time interval that the clutch pedal is in actual motion while releasing or engaging, and merely compensates for the slight rotation of the front traveling cam to gain clutch release. Hence it must not be considered as a release bearing.

When the engine is dead the actuator, of course, remains inactive, but clutch release is obtained under these conditions in the normal manner, since the front traveling cam assembly remains free to slide axially on the carrying sleeve. One-third of a revolution of the engine in starting, however, puts the clutch actuator into operation, releasing the pressure.

Apparently the actuator mechanism does not require periodic lubrication.

The Horizons of B

The Commentator's Role

THE recent conclave of bankers in Washington may be described as an ostentatious rapprochement between two parties, the financiers and the government, who distrusted each other but nevertheless felt that cooperation or the appearance of cooperation between the two was necessary in the interest of recovery. The government, if its literal utterances be taken at their face value, considered the money changers responsible for much of the wickedness which corrupted the land during the "twenties." Whether this represents an accurate or fair analysis of banker responsibility for the depression or whether the government takes such a position as a matter of political convenience is beside the point. The fact is that Wall Street and the bankers had been charged with social and economic crime.

A Feast of Love

On the other hand, the members of the A.B.A. were certain they discerned the transparent intention of the government to make scapegoats of them. Their faith in the integrity of the government, as a matter of policy, could not be subjected to a strong light. Nevertheless, Jackson Reynolds, spokesman for the bankers, in words that revealed a tolerant understanding of the President's peculiar position welcomed him, while Mr. Roosevelt on the other hand effusively embraced the much maligned money changers. It was a feast of love. If it results in an abandonment of the governmental vilification and a moderation by the bankers of their highly virtuous demands for a balanced budget, sound money and controlled relief, both sides and the country as a whole may profit.

Moderate Criticism Difficult

Now it is difficult for an honest critic to expose extenuating circumstances that improve the light in which the government stands. Not because the critic refuses to admit such circumstances or weigh the pros and cons of government policy with judicial detachment. Such instincts of justice have been choked by the arrogant righteousness of government spokesmen, their exaggerations of credit due and their uncompromising denunciation of all critics. It is an attitude fatal to judicial consideration of government policies. The fair critic is forced to take a position which makes him seem wholly opposed to the government. Insofar as he realizes his own responsibility to the public, whose thinking he influences, he knows that the people who pay the salaries of their servants in office will never discover the shortcomings of those servants from official documents and speeches.

Government Publicity Forces Critic to Raise Voice

There is another impulse operating on the disinterested critic which Kant might have called a "manifestation of the categorical imperative." Democracy is predicated upon universal suffrage and free speech. During the discussion of the newspaper publishers' code the industry insisted upon a clause which guaranteed the right of free speech. The government at first argued that such an assurance was superfluous in view of the constitutional guarantee, but finally granted the publishers' demand. It clearly indicated that in so doing it was merely humoring a group of men who had developed a ridiculous obsession and that the concession was in no other sense necessary.

The term freedom of speech refers to specific expression, e.g., calling a Congressman a scoundrel, or criticising the extravagance of the government. There is another form of suppression which, for want of a better term, we shall call suffocation. It has precisely the same effect as the direct prohibition of speech.

This country has never had a government so publicity-minded as the present. Every alphabetical administration has its own press bureau. The established departments of the government have highly organized articulation. Speakers by the hundred are available to defend the conduct of the state. Cabinet officers and department heads spend much of their time carrying the good word to the provinces, and this of course is true of the President himself. As one reads this mass of oratory certain conclusions become immediately clear.

Brief Digest of Government Publicity

1. The government has yet to make a single serious error.
2. It is actuated only by the most exalted motives.
3. Uniform justice is extended to all—even to Republicans and business men.
4. The public funds are spent only for the public good.
5. Every critic is a deep, dark-dyed villain, a "tory," "reactionary," "exploiter," etc.

Bear in mind that the government usually has the right of way

Business

by Joseph Stagg Lawrence

in the headlines, and that this flood of publicity has been coming out of the capital without a pause since the New Deal was launched. The fact is that the critic, who rashly undertakes to restore to the public a sadly distorted perspective toward its government is drowned in a klaxon chorus of speeches and releases. Although this presents a serious reflection on democracy, the situation does not lack humor. When the apoplectic apologists of the government have exhausted every form of personal vituperation and every iota of opposing evidence they conclude as they usually commence with the emphatic observation that the utterances of the critic are propaganda. In view of all this it is difficult to maintain judicial calm, to grant mitigating circumstances and offer credit where credit is due—or eschew criticism where it is clearly deserved.

Things Unsaid

In spite of all this provocation to partisanship the honest observer must record certain conditions that make it inadvisable for the government to follow a course which the business situation seems clearly to demand. We refer again to the bankers' convention. The President told the boys that they were doing a good job in camouflaging their horns, tails and ruddy complexions—or—perhaps he had been under an illusion in the first place in observing these details. That pleased the audience.

When all the President's pleasant words had been taken apart and classified it was found that there were certain things which he did not say. To the bankers these things unsaid were more important than the President's smile. He said nothing about the budget. No assurance did he offer regarding a further corruption of the dollar. How far the government would go in extending relief the President did not vouchsafe. Employers listened eagerly for some word that labor agitators would be checked. The disappointment was perfect.

Accounting for Office Holders

For reasons that will appear obvious, the President could not say much on these subjects and, worse still, could not reveal the reasons for his failure to take a definite position. Every man who holds public office must resolve his conduct into the form of an account. The units of entry are votes. In keeping his books he applies certain principles.

The first is that every voter injured, actually or in fancy, becomes a vote for the other candidate at the next election. The second and far less active principle is that every voter benefited becomes a vote for reelection, provided such a voter at the next election feels that the man in office will extend more favors than the other candidate.

Another principle is that the sense of injury lasts much longer than the sense of benefit. It is much more certain, for example, that the veterans will vote against the President for vetoing the bonus than that farmers will vote for him because the government has raised their income. The resentment of the veterans is a more enduring impulse than the gratitude of the farmers.

Live Politicians Versus Dead Statesmen

The country has had public servants in the past who have ignored this form of accounting and have consulted only the best long-time interests of the nation. To the extent that they surmounted direct considerations they acquired qualities of statesmanship. Perfect statesmanship is possible only in a political vacuum. To make it less abstract we may call it dictatorship. Mussolini can ignore votes because he has the power of ultimate political discipline firmly in his own hands. In this country our public servants, those who remain in public office, believe that it is better to be a live politician than a dead statesman. Their first concern is to remain in office. It is not unfair to appraise the policy of the government in the light of these observations.

When the President spoke to the bankers he might have told them that the government would have a balanced budget by 1936, that relief must terminate at the end of the preceding fiscal year, that no further tricks would be played with the dollar, that management need not fear the tyranny of organized labor. The statements would have been acclaimed by loud and genuine huzzas from the bankers. Unfortunately the bankers today, politically, are lightweights. The statement which so pleased them would have been a red flag to the inflationists, to the boys who have just been elected on their promises to deliver, to the proponents of a deliberately unbalanced budget, and finally to organized labor.

Economically such a statement would have been "swell." Politically it would have been stupid. This conflict between the indulgence of politics and the discipline of economics is a part of the cost of democracy.

The Forum

The Average 1934 Car

Editor, AUTOMOTIVE INDUSTRIES:

The writer believes that the economic value of streamlining has been greatly overestimated. The sponsors of streamlining seem to overlook the power "overhead" which most certainly exists in the conventional automobile. This "overhead" is responsible for the major portion of the fuel consumed at average road speeds.

In *Automotive Industries* for May 19 there appeared a framed article on page 604, having the title "Average Engine Develops 173 Lb.-Ft. at Peak Power."

Could *Automotive Industries* favor us with more information on this average engine and car? What is the peaking speed or maximum horsepower of this average engine? What is the maximum speed in m.p.h. of this average car?

Finally, what is the general *torque load* at which the engine is operated when this car is traveling at average road speeds?

Our estimate is a 23 per cent torque-load factor for a road speed of 45 m.p.h.

FRASER A. HURD.

No direct figures are available for any great number of cars as regards their maximum speeds, but by calculation most of the factors asked for can be arrived at with a fair degree of accuracy. The average maximum horsepower of all American 1934 passenger-car models is 112.5 and the average shipping weight of all sedan models for which figures are available is 4200 lb. With supplies and two passengers the weight would be about 4700 lb. The average maximum speed of sedan models with two passengers is probably close to 80 m.p.h.

Maximum speeds would naturally be determined on very smooth roads, for which the resistance to rolling motion is probably about 16 lb. per 1000. This would make the rolling resistance of this car

$$4.7 \times 16 = 75 \text{ lb.}$$

and the horsepower consumed in overcoming rolling resistance at 80 m.p.h.,

$$\frac{75 \times 80 \times 5280}{60 \times 33{,}000} = 16 \text{ hp.}$$

Now, when the car runs at maximum speed the engine generally runs above its peaking speed, so that the engine horsepower is not equal to its maximum. We may allow 5 per cent for this and 5 per cent for loss in transmission. This would make the horsepower available at the driving wheels at maximum car speed equal to

$$0.90 \times 112.5 = 101.$$

As 16 hp. is consumed in overcoming rolling resistance, there remains 85 hp. for overcoming wind resistance.

The rolling-resistance horsepower varies directly as the car speed, hence its value at 45 m.p.h. is

$$(45/80) \times 16 = 9 \text{ hp.},$$

while the air resistance horsepower varies as the cube of the car speed, so its value at 45 m.p.h. would be

$$(45/80)^3 \times 85 = 14.5 \text{ hp.}$$

The sum of these two items is 23.5 hp., which is that required at the wheels. Figuring again on a loss in transmission of 5 per cent, the engine horsepower would be

$$23.5/0.95 = 24.75 \text{ hp.}$$

The average rear axle ratio is 4.45 and the average wheel diameter 30 in., hence at 45 m.p.h. the engine speed would be

$$\frac{45 \times 5280 \times 12 \times 4.45}{3.14 \times 30 \times 60} = 2240 \text{ r.p.m.}$$

Incidentally, to make 80 m.p.h. these engines would have to run at

$$(80/45) \times 2240 = 4000 \text{ r.p.m.}$$

To develop 24.75 hp. at 2240 r.p.m. the engine torque must be

$$\frac{24.75 \times 33{,}000}{6.28 \times 2240} = 58 \text{ lb.-ft.}$$

The average speed of maximum output of 1934 engines is 3420 r.p.m. The average torque at maximum hp. is 173 lb.-ft.; at 2240 r.p.m. the maximum torque will be about 20 per cent greater, or 208 lb.-ft. Therefore, the torque load at 45 m.p.h. is

$(100 \times 58)/208 = 28$ per cent of the maximum at that speed. The remaining 72 per cent enable you to get ahead of the truck that is bowling along at 45 m.p.h.—Editor.

Front-Drive for Rear-Engine Car

Editor AUTOMOTIVE INDUSTRIES:

Please call the attention of American manufacturers to the fact that in their streamlining they have neglected air resistance on the under sides of their cars. In regard to reduction of such resistance, the old Decauville steel pan, supporting the engine and extending to the side members of the frame, is of interest. If such a steel pan were extended far back in the chassis, it should reduce air resistance considerably. I remember, though, that the Cunningham car of about fifteen years ago had a sheet steel under member that extended back of the middle of the chassis.

For another thing, why not call attention to the fact that rear engine position allows front-wheel drive very easily, and that if the gearbox were combined with the bevel gear and differential housing in one unit located at the front of the car, the weight of that unit at the front end would tend to balance up the car, which, with rear-wheel drive, probably would be excessive at the rear. Also, such a rear-engine, front-drive car would be without the congestion of front-engine, front-drive cars. If independent suspension in the rear were adopted in such cars as the DeSoto and Chrysler, a unit made up of the gear box and the bevel gear and differential housing could be located in the rear portion of the frame and would balance the car considerably, which, I assert, is out of balance now because of the forward position of its engine away over the front axle

and the forward center of gavity of the body.

In regard to rear-engine cars, I call atteniton to a question that most people have not thought of but that becomes bigger the more that one thinks of it. It is the question of how to drive the radiator fan if the radiator is located at the front of the car. With front wheel drive, it might be driven from the drive shaft just back of the gearbox and bevel gear and differential unit.

STANLEY B. ARNOLD,
San Diego, Cal.

Retractible Headlamps Proposed to Cut Drag

Editor, AUTOMOTIVE INDUSTRIES:

Suitable headlights for streamline vehicles seem to present quite a problem. Why not use retractible lamps? In high-speed, daytime driving they could be flush with the streamline form, and at night they could be arranged to protrude the necessary amount to bring the beams into alignment.

HENRY F. ROBBINS.

Copper Cylinder Heads

Editor, AUTOMOTIVE INDUSTRIES:

The benefits obtained from the use of materials of high thermal conductivity for combustion-chamber walls have been known for a number of years. Aluminum alloys, used for a considerable time in aircraft work, have found favor with motor-car engineers in recent years, but copper, a material of higher conductivity, has received only little attention as a cylinder-head material. Copper should appeal to the designers of automobile and stationary engines, while, so far as the aircraft-engine manufacturer is concerned, the increase in weight necessary with it, as compared with the present aluminum cylinder head, would be an unfavorable factor.

The thermal conductivity of copper is influenced by its purity. Zinc, tin, phosphorus, silicon, arensic and other elements present as impurities result in a reduction of the conductivity. Silver, on the other hand, tends to increase not only the hardness but also the heat conductivity of copper, and ingots of Lake Superior copper contain a sufficient amount of silver to make the metal from that district particularly suited for the manufacture of articles requiring a high thermal conductivity.

There has been some question as to whether a material of higher conductivity than aluminum could be used to advantage in cylinder-head construction. Desiring to find additional uses for copper, the Michigan College of Mining and Technology conducted a series of tests to determine the value of this metal as a cylinder-head material. The project was a part of an F.E.R.A. program, the tests being run by H. E. Anderson and D. S. Stuart, F.E.R.A. research assistants, under the direction of the writer.

Cylinder heads of cast iron, cast-aluminum alloy, and cast copper were tested on a modified Fairbanks-Morse single-cylinder engine. A series of heads varying in compression ratio from 6:1 to 8.5:1 were constructed of each of the three materials. The spark advance for incipient knock was determined for each of the heads, while the r.p.m., manifold vacuum, and temperatures of the coolant and mixture were kept at constant values. The basic design of the heads was influenced by the existing engine structure, and although the form of the combustion chamber and the thermosiphon circulation of the coolant may not favor the aluminum and copper heads, it is felt that the test furnishes a good comparison of the performance of the materials. With a more suitable design the materials of high heat conductivity may show up even more favorably.

Fig. 1 shows the effects of material and compression ratio on the spark advance for incipient knock. By running up on a constant-spark-advance line, we obtain the compression ratios of heads of the three materials which give equally good results on the same grade of gasoline, as far as incipient knock is concerned. By using a number of heads rather than a variable-compression engine, the effect of the compression ratio on turbulence was decreased, and the tests did not show any wide variation in results between the high and low-compression ratios used.

The possibilities indicated by the results of this preliminary investigation were such that additional work was started upon to study various designs, so that copper can be used in the most economical and efficient manner.

H. W. RISTEEN,
Assistant Professor of Mechanical Engineering, Michigan College of Mining and Technology.

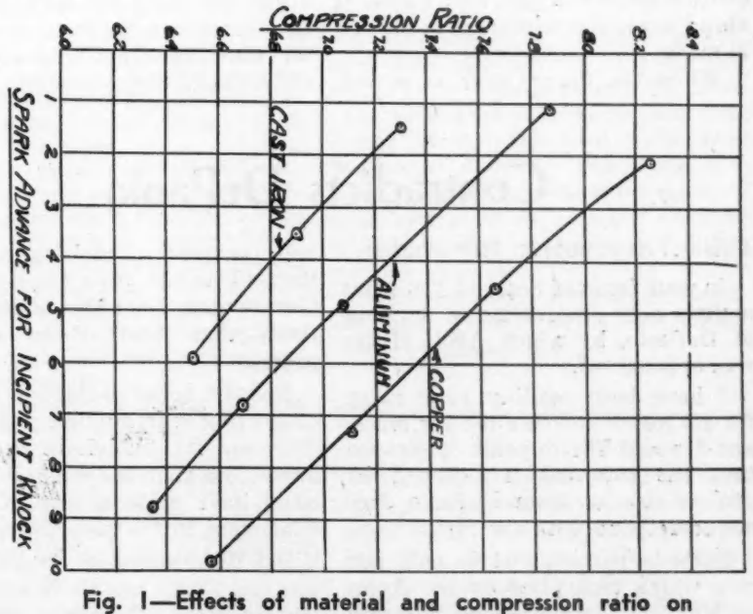


Fig. 1—Effects of material and compression ratio on spark advance for incipient knock

THE FORUM

A Basis for Judging Transmission Improvements

Editor, AUTOMOTIVE INDUSTRIES:

Referring to a letter from Paul Neff in *Automotive Industries,* he strikes the keynote of transmission control when he says: "That as long as pedals are used to start and stop cars improvements in control should be judged by the degree to which they distract the driver's attention from the pedals and steering wheel."

When the driver comes to a traffic stop he will almost unconsciously push the clutch pedal ahead, and when the signal changes, will let the pedal back. If he is driving a car with a power shift he simply straightens out his finger on the steering wheel and moves a small lever over an index card marked R.N.1.2.3. before pushing the pedal ahead; the gears will be shifted when the pedal is pushed ahead, and the car will start in the selected gear as soon as the clutch engages.

If he fails to move the finger lever to a speed change before stopping, he can move it while holding the pedal ahead, and the first movement of the pedal's release will shift the gears before the clutch engages. While the car is gaining speed he can move the lever for the next speed change, and when the pedal is pushed ahead again the selected gear change is made.

When the finger lever is moved, the following movement of the pedal, either ahead or back, will release the trip lever that causes the engine to shift the gears, before the clutch can engage.

The trip lever may also be released by pulling up on the finger level and the engine will push the clutch out, shift the gears, and engage the clutch without the driver touching the pedal, but I find this takes more time and attention than to let the pedal release the trip lever.

The power-operated shift does not add any load or extra movements to the pedal, and is controlled by a finger without taking the hand from the steering wheel, which leaves one's hand free for the brake when starting a car uphill. After using the device a few times the driver will locate the speed changes without looking at the index card, which is held in place by a license ticket holder on the steering column under the finger lever.

Years of experience and millions of drivers have proved that the easiest, quickest and safest way to apply the power of a gasoline engine to the drive wheels of an automobile is through the pedal-controlled friction clutch. You can have the engine developing maximum power and quickly move a car a fraction of an inch or more out of a bad place, and instantly stop it. These and other features seem to indicate that this method of power transmission for automobiles will be used indefinitely.

BURTON A. WALRATH.

Transmissions from the Driver's Viewpoint

Editor, AUTOMOTIVE INDUSTRIES:

The discussions of transmissions by Mr. Neff and Mr. Bearce in the Sept. 22 issue have led me to offer a comment from a driver's point of view—a different point of view, however, from that of Mr. Neff and others who feel that the gearshift lever gives a "feeling of running something." Without attempting to argue my case, but with the belief that there are really a great number who share my opinion, may I state that I consider the gearshift lever an unnecessary and inexcusable nuisance. I also feel that automatic clutches and automatic mechanical shifting offer only a halfway solution of the problem, acceptable during the transition period but not the final goal.

I fully agree with Mr. Bearce that the industry should " 'pluck' out the conventional train of gears." A hydraulic transmission of the Waterbury Speed Gear type seems to me to offer great possibilities, although I realize that the engineering problem is not an easy one.

It would not seem to be too much to hope that when the car of tomorrow emerges with its streamline shape, its relocated and redesigned engine (rear mounted, radial, water cooled?), its improved roominess, comfort and visibility, it will also be found to have a hydraulic or electric transmission.

And would not the advantage of running the engine at a constant speed the major portion of the time be a considerable one? Oh, yes, that suggests a compression-ignition engine, does it not?

All of which is meant only to show that the driver is interested and does think about these things.

L. C. LEONARD.

Contradicts DePaolo

Editor, AUTOMOTIVE INDUSTRIES:

In your issue of Sept. 15 you print a little note concerning an accident of DePaolo, by which Adolf Hitler was endangered.

I have been reading your paper for six years and like it very much, and I would like to point out to you that the information reported by you as coming from DePaolo does not correspond with the facts.

DePaolo participated in only one race which took place on the Avus, on May 27. As I attended this race and occupied a position not more than 10 meters from the box of the Government, I am able to state positively that Adolf Hitler was not present.

Nobody, not even DePaolo saw any connecting rods hurtled, and even if they had it would have been quite impossible that the connecting rods could have made a way of several kilometers to the place where Adolf Hitler was staying at the time.

H. NORDHOFF,
Mainz, Germany.

Car Makers Await Conference

(*Continued from page* 567)

In identical letters to Mr. Macauley and A. F. of L. president Green, the President said that there were a number of matters connected with the code with which he had never been satisfied. After referring to conversations with manufacturers on arranging work so that employees would have a reasonable assurance of employment throughout the greater part of the year, he said, "For example, it is not very useful to pay a man $10 a day if he is employed only 65 days in the year." As another example, he said that statements had been made that average earnings of automotive employees have been less than $900 per year for the entire group.

The industry naturally was not particularly grateful for the emphasis which Presidential recognition gave to the $900 statements. If yearly workers include those taken on for short periods during peak production because the code limits the work week to 48 hours, thus increasing the number of temporary employees needed, an average of $900 possibly can be arrived at. But eliminating those workers forced on the industry by the code hourly limits, the yearly average is well above $900, according to information obtained by *Automotive Industries*. For automotive workers on permanent payrolls, average yearly earnings are about $1,300 in the vehicle plants, about $1,200 in plants manufacturing for original equipment and about $1,100 in replacement parts plants many of which are located in smaller communities.

Hourly rates at present are at the highest level in the history of the industry in the automobile plants according to one important executive. In the parts industry, also wage rates have risen phenomenally since the first of the year. Despite these high rates, weekly earnings at the present time, however, are low due to reductions in hours effected to spread available employment during the seasonal slump. Most factories are working on a two to three day week basis, but the limit has about been reached in this direction and lay-offs are anticipated with further declines in output.

It is presumed that the facts about automotive employment in the President's investigation will be developed by the Bureau of Labor Statistics. This Bureau has already made a number of studies of this kind with the cooperation of several important factories. As for the general economic aspects of the problem, it is regarded as not unlikely that these will be considered by the Planning and Research Division of NRA.

The problem which the President posed in announcing the investigation is not a new one. In fact, it is about as old as the industry. However, if out of this investigation comes a constructive plan for eliminating some of the jags in the industry's production and employment curve, none will be more sincerely grateful than the industry's manufacturers. The industry, however, is not overly sanguine that this will be the outcome.

The industry feels that the most important contribution it can make to national prosperity is to build and sell more cars. Its experience indicates that it can get maximum sales by selling and delivering cars when the public wants to buy them. Since the public has chosen to do a majority of its buying in the first half of the year, this has led inevitably to a seasonal peak in production.

Labor has criticized the industry for this policy, insisting that if smaller sales are the price of more stable employment, the price is not too high. However, smaller sales mean less total employment and payrolls during the year. So the question resolves itself into whether it is more desirable to have less employment and payrolls spread more evenly over the year, or more employment and payrolls spread less evenly. With full appreciation of the hardships which seasonal employment imposes, the industry has held to the view that more employment and payrolls were the better solution.

Much of the criticism of the industry's sharp fluctuations overlooks the fact that manufacturers have a vital stake in stabilizing output, entirely aside from their real interest in the human consequences of these variations. Seasonal peaks mean that enough plant and equipment must be provided to take care of maximum production and during a large part of the year much of these assets must be idle. These insurance costs obviously affect profit.

There is no need here for rehashing the reasons why the industry has not been able to attain more stable production as they are all familiar in automotive circles. Because the industry has not been able to solve the problem, however, does not mean that it has not been studied or that manufacturers do not appreciate the human and financial consequences of fluctuating production.

Wholesale and Retail Car Financing Gain in 9 Months

Wholesale financing done by 282 identical finance organizations for the first nine months of 1934 amounted to $785,293,692 as compared with $406,745,621 for the same period of 1933, according to data just released by the Bureau of Census. This represents a 93 per cent increase for the first three-quarters of 1934 as against the comparable period for 1933. During September of this year the dollar volume of wholesale financing amounted to $62,265,238 as against $51,127,429 a year ago, an increase of approximately 22 per cent.

Total retail financing for the first nine months of this year amounted to $689,902,427 as compared with $461,937,665 for the same period last year, an increase of about 50 per cent. In numbers of cars financed the first nine months shows a gain of 39 per cent over the like period of 1933. Of the number of cars under retail financing, 836,961 were new, 957,092 were used cars and 36,528 were unclassified.

During September, 84,252 new cars were financed with a value of $46,268,067, a gain of about 8 per cent in number of cars and approximately 13 per cent in dollar volume as compared with September, 1933. Used cars show an increase in number of 11 per cent and in dollar volume of 15 per cent over September a year ago, actual figures for September, 1934, being 101,961 used cars financed, with a dollar volume of $23,477,063.

Sales Spurt as October Ends

(*Continued from page* 567)

this year to October 20 of approximately 10,000 cars, giving a sales volume of $11,912,400. With Plymouth sales added the total is over $72,000,000 and represents a 27.5 per cent increase over last year. Factory officials state that approximately 1,000 dealers were added during the year.

Shipments of Hupmobiles for the first 10 months of 1934 are 15 per cent better than for the corresponding period of 1933. In fact, shipments to October 31 exceed the 1933 entire 12 month total. Last month's shipments showed a gain of 64 per cent over October, 1933, and was the best October since 1930.

October shipments of new 1935 Auburn cars totaled 757. This is more than three times the number shipped by the company in October of last year and the largest October Auburn has had since 1928. At present the company has more than 400 unfilled orders on hand.

Retail sales of Dodge passenger cars and trucks for the week ending October 27 totaled 4270, as compared with 4090 for the preceding week. Sales of passenger cars amounted to 3402 as against 3061 the week before, an increase of 11.2 per cent. The week's truck deliveries, compared to those of the previous six-day period, showed a slight decline, being 868 as against 1029 in the previous week.

Retail sales of Hudsons and Terraplanes exceeded 5300 units for October, the best October the company has had since 1929. The October gain over September sales was 33.9 per cent, and compared with October of 1933 the gain was 49.5 per cent.

Hudson sales in the first week of November exceeded 1,000 units.

Cadillac sales in the last ten days of October exceeded sales in any similar period since last May.

AAW Demands Reopening of Automobile Code

A demand for the reopening of the automobile manufacturing code and objection to the "merit clause" has been made by the delegates to the first convention of the Associated Automobile Workers of America. This is the new union formed by automotive workers when several locals formerly affiliated with the A. F. of L. seceeded from the parent organization.

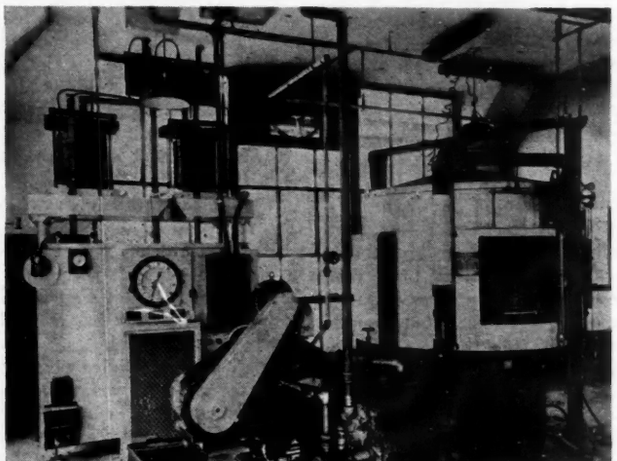
Permanent officers were elected by the delegates. Forrest Brown of Lansing, Mich., was named president.

Third Quarter Net Loss Reported by Packard

Packard reports net loss in the third quarter of $2,380,265 making the total deficit for the first nine months, $5,348,409 after all charges. The company says these figures reflect the cost of preparing for introduction of its new car.

NEW DEVELOPMENTS

Automotive Parts, Accessories and Production Tools



Rotary Hearth Type Furnace Handles Small Parts

A small rotary hearth type furnace for the economical heat treatment of miscellaneous lots of small and medium size products has recently been developed and built by The Electric Furnace Company, Salem, Ohio.

The material is charged onto tilting trays by a sliding bottom loading pan, carried around the furnace on an alloy hearth and dumped through a chute to a water or oil quench. With this furnace the handling or small and medium size parts is placed on a continuous and economical basis.

This furnace is specially adapted for the handling of springs, bolts and miscellaneous machine screw products.

The accompanying photograph shows the charging door of the furnace, quench tank, conveyor, recording controllers, etc. The transformers are shown mounted above control panel.

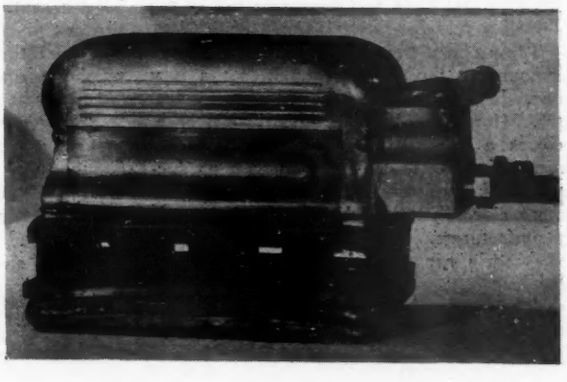
Sanding Machine Cuts Time Element

One of the most unique sanding and polishing machines designed for industrial use is being introduced by the Sterling Products Co. of Detroit and Los Angeles. It weighs 7 lb. and operates on 70 or more pounds of compressed air (using 6 cu. ft. of air per minute), thus making it suitable for small shops as well as the heaviest production lines.

The Sterling Speed-Bloc Sander operates on a principle not entirely new, but it applies this principle successfully on metal, wood or marble surfaces. The sanding motion is an oscillating or reciprocal one. The stroke travel of the abrasive pad is 1¼ in., at the rate of between 2500 and 3000 oscillations per minute. The pad moves back and forth with the same motion as in hand sanding.

This machine is unusual in construction with regard to the pad device which carries the abrasive paper. This is made of rubber and felt, and is bridged in such a manner as to be fully flexible, hence it is applicable to convex or concave surfaces, along mouldings and in places difficult to sand.

Due to its light weight and small size, being 7¾ in. long, 4¾ in. high and 3¾ in. wide, it can be used on all types of work for long periods of time without tiring the operator. It is fitted with a water connection and can be used for wet sanding as well as dry sanding.



Sterling sanding machine

Masking Fluid For Stripping

A novel rubber product of non-inflammable character has been developed by Kelsan Products, St. Clair, Mich. It is a liquid, masking fluid that can be applied either by spray or brush. While it forms a fairly thick protective coating, it can be readily stripped by hand or otherwise without leaving a trace.

According to the manufacturer, this material has withstood a temperature of 250 to 275 deg. F. for six hours, with excellent results, in their own laboratories. It is claimed that one of the large Detroit body builders is testing the material for use as a protective coating for the body finish in the shipment of cars and bodies.

Instrument-Panel Radio Control

A special control unit, designed for mounting on the instrument panel or dash of a number of modern cars, has been introduced by the General Electric Company's merchandise department, Bridgeport, Conn. With it, G-E Models C-60 or C-61 auto-radio receivers can be converted from steering-post to instrument-panel control.

The new unit is intended especially for use on 1934 model Chryslers, De Sotos, Dodges, Fords and Plymouths. On these cars, installation of the control necessitates no additional work or adaptation expedients. The unit can also be adapted to other cars, provided sufficient space is available on the instrument panel.

for superiority in motor cars

★

Looking for Uniformity in Gear Steel?

To TAKE heat-treatment properly, without frequent changes in the treating cycle, gear steel must be uniform.

We operate extensive heat-treatment facilities of our own and heat-treat a substantial part of the production of our alloy-steel plant. Our metallurgists and steel-makers appreciate the need for the utmost uniformity in steel that has to be heat-treated. In the Bethlehem Alloy Steel Plant the production of uniform alloy steels is a habit.

You will see the results of this habit of uniformity in the way gears of Bethlehem Nickel-Molybdenum Gear Steel march through your heat-treating processes, one heat upon the heels of another, without the need for change in the treating curve.

In other respects, too, Bethlehem Nickel-Molybdenum Gear Steel is outstanding. In tooth strength, freedom from warpage, machinability. These qualities account for its use in the ring gears and pinions of so many of today's motor cars.

Tool Steel

that "licks" many a machining problem

WHETHER it's a high-test iron casting with an extremely hard surface, or a lot of steel with a grain structure that makes it tough to machine, you can count on Bethlehem Special High-Speed Tool Steel to rise to the occasion.

The high temperature at which this steel holds its edge, the taxing combinations of feed, speed and depth of cut that it stands, the length of time between grinds, are sources of amazement to shopmen who try it for the first time.

Bethlehem Special is right in its own element in heavy-duty tools for lathes, planers, boring mills and similar machine tools. It is also a fine material for twist drills, milling cutters, taps, reamers, gear-cutting hobs, inserted saw-teeth, special dies, wood-working tools and punches.

For High-Grade Iron Castings

MAYARI PIG IRON, a natural nickel-chromium pig iron made in two types, Standard and Silvery, offers a simple, economical means of making high-grade alloy-iron castings. Castings that are strong, easily machined, wear-resisting, free from blowholes and spongy spots, even on thick sections.

Silvery Mayari—low in carbon, and high in silicon and in manganese—simplifies the manufacture of machinable high-test castings, using large quantities of steel scrap.

STEEL WIRE

BOLT and screw wire; spoke wire; spring wire.

BOLTS AND NUTS

BETHLEHEM'S self-contained bolt and nut plant produces a complete range of bolts and nuts and related products, including not only standard items but many "specials."

BETHADUR AND BETHALON

BETHLEHEM'S corrosion-resisting steels, Bethadur and Bethalon, cover the entire range of this class of materials, including the free-machining grades.

ROLLED STEEL BLANKS

FOR gears and pinions, flywheels, tire moulds and mould rings, shaft couplings, brake wheels and drums, and other circular forgings.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY GENERAL OFFICES: BETHLEHEM, PA.

District Offices: Atlanta, Baltimore, Boston, Bridgeport, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Detroit, Houston, Indianapolis, Kansas City, Milwaukee, New York, Philadelphia, Pittsburgh, St. Louis, St. Paul, Washington, Wilkes-Barre, York. *Pacific Coast Distributor:* Pacific Coast Steel Corporation, San Francisco, Seattle, Los Angeles, Portland, Honolulu. *Export Distributor:* Bethlehem Steel Export Corporation, New York.